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The Architect and Engineer

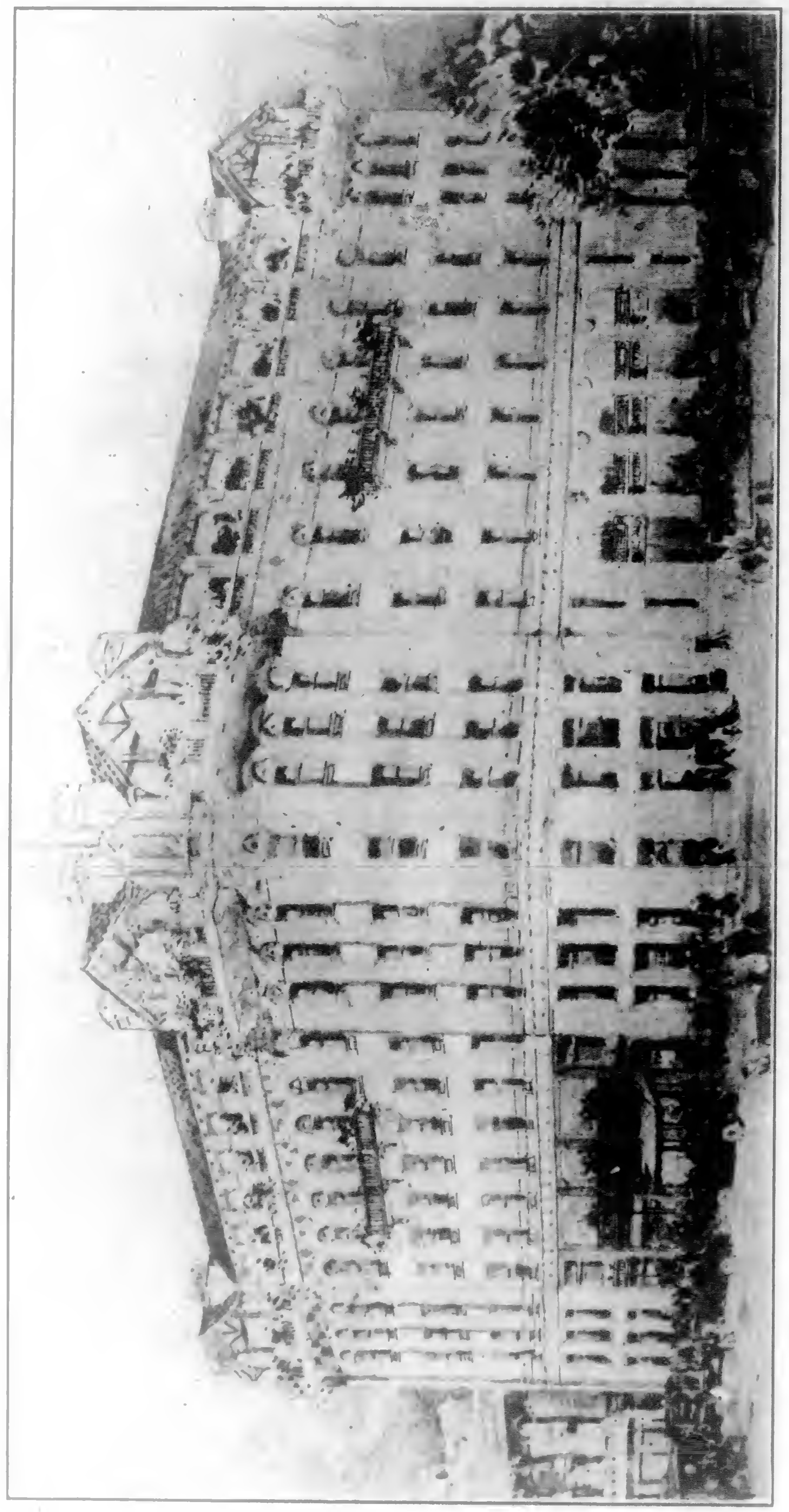
of California
Pacific Coast States

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Issued monthly in the interests of Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast.

Contents for January

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Frontispiece
The Architect and Engineer of California
January, 1909

Hotel Sacramento, Sacramento, Cal.
Sellon and Hemmings, Architects

Equipped with Otis Elevators.

THE

Architect and Engineer

Of California

Pacific Coast States

VOL. XV. JANUARY, 1909. No. 3.

Address of President Cass Gilbert at the Forty-Second Convention, American Institute of Architects.*

IT HAS become the custom for the president of the Institute to present at the opening session of each convention an address or message summarizing the work in the past or suggesting work for the future. And, reluctant as I am to consume the valuable time of the convention, I comply, in the hope that it will not be amiss to suggest some general ideas for your consideration.

Each year of the Institute's life bears a general similarity to each preceding year, and yet each year brings new problems, or the more complete solution of old ones; and finds the Institute growing in spirit, larger in numbers, stronger in faith in itself and with a rightly increasing influence both on the art we practice and on the relations of the public and of the government to that art.

If we compare the broad influence of the Institute today with even that glimpse of the "Golden Age" some fifteen years ago, when the Columbian Exposition was built, by the leaders of our Institute; and we achieved governmental recognition as a profession, through the passage of the Tarsney Act; we will see the sure advance of a great national organization to a truly national scope—and so seeing we will realize the responsibilities that come with increased authority. Let us grow in wisdom as we have grown in numbers, in power and in material wealth.

I forbear to make a comparison in detail or to furnish statistical records, but the evidence is before you in the fact that through the wise councils and unselfish endeavor of the Institute we have come to be the adviser, and as need arises, the respected arbiter in matters of the gravest importance. Then it was with difficulty that we obtained a hearing from either the public or the government. Today we are welcomed in the councils of all those who sincerely desire to do well in matters within the sphere of our profession. Our great and growing cities, our states and the national government itself, all call upon us for professional counsel and approach the subject of architecture and the other fine arts from a standpoint largely influenced thereby.

The President of the United States, in calling together that notable conference of the governors for consideration of the conservation of the national

* Convention was held at Washington, D. C., December 15, 16 and 17, 1908 and was attended by more than one hundred and twenty-five delegates and alternates from practically every state in the Union.

resources of our country, invited the American Institute of Architects, as one of a few organizations of national scope to take part therein, and we have now an Institute Committee acting with the Conservation Commission which grew out of that conference. This commission, will, I believe, become one of the greatest powers for national good that has ever been created.

Many of the states are considering laws for the licensing of architects, some have already passed such laws, whether with wisdom or not will only be proved by experience, but for the present it may be said that it is an experiment intended to be for the protection of the public and of the architects alike.

Several of our cities have official consulting architects to advise as to the best method of procedure and to guide their officials in all matters of design.

Civic associations and municipal authorities are calling the members of our profession to assist in the study and betterment of civic conditions, the designs of streets, parks, bridges and public monuments, and I need not add that the members of the Institute have responded cordially in assisting in these endeavors for the general good.

Our relations with individuals and corporations, with the public and with the government have been fostered and strengthened and we hove won the confidence of them all because we have endeavored to deserve it.

Abroad, the Institute is recognized as one of the greatest organizations of its kind—and our affiliations with foreign societies of art, science, and letters are growing closer from year to year.

The Congress of Architects in London of 1906, and in Vienna of 1908, and the international incidents of the last convention of the Royal Institute of British Architects have demonstrated the increased respect in which our Institute is held and promise a closer relation with consequent mutual advantage for the future—such closer bond of sympathy and understanding between American and foreign societies of like intention has not been without encouragement from the National Government, however, indirect or incidental, and in a large sense makes for a better understanding between nation and nation, weaving one more strand in the fabric of amity that makes for the peace of the world.

Our committees have chosen as the principal topic for this convention the relations of the arts to the government, and you will be invited to consider, and act on that proposition that it is desirable for the art works of the government to be under the general control of a Bureau of the Fine Arts. I will not anticipate the report of the committee by more than this brief reference to the subject, but may add that in all of our discussion of it we must bear in mind that we look at it from only one side, viz.; that of the artist and the professional man, but that before such a proposition can be enacted into law it will be subject to careful legislative scrutiny; it will be considered from the standpoint of economy and administration, and many objections will doubtless be raised; many corrections and amendments will be made. But the outcome will be progress.

Let us do our part with wisdom and care, let us consider what we ought to do and balance it off against what we can do. Let us not forget that we are citizens with the citizen's duty to do, so far as we can do it within our own sphere; and with the citizen's right to suggest or demand; but that we are neither statesmen nor legislators and that to them is committed the responsibility for the enactment of laws and for the finding of ways and means.

The convention will probably consider among other things the ever present and intimate topics of professional ethics, competitions and schedules of charges. Let us deal with all these matters in a very broad way, and be guided by generous consideration for the other point of view, whatever it may be. Let us be generous, even to ourselves.

In the matter of ethics, I quote an extract from the constitution and by-laws of the Civic Club of New York:

"We stand:

"For knowledge and progress; for rational enjoyment and for whatever is right.

"No man can grow unless he has room in which to grow; we will not crowd the next man, but we will not be crowded by him. We will therefore give and take, but we will not compromise nor temporize with wrong or with wrong-doers. We will leave the hiding places to the weak and will fight for them and for ourselves in full view of all.

"We will cultivate friendship with all, but we will not fear the enmity of those who oppose our principles."

Let us have an ethical code so broad that it will cover all right conduct.

Moral right is the basis of all ethical codes. We cannot create moral right or wrong by fiat of a convention. In moral law, what is right today was always right. It is only by instinct, experience and wisdom that we perceive moral law as applied. We do not always perceive accurately, hence our codes change with the years and with the conditions. It is character, not codes, that determines a man's life and his relations to his neighbor.

Let us beware of the hasty adoption of a narrow code which would place the technical stigma of "unprofessional conduct" upon honorable practitioners, or limit the proper activities and usefulness of our members.

Let us sternly rebuke those forms of practice which infringe on moral right, which place selfish interest above the general good; or tend to lessen the dignity or lower the tone of the profession. And with just and well-considered rules of conduct, let us hold ourselves as well as our neighbors to strict accountability for their fulfillment. In short, let us have the right code or none at all! The Institute is safer relying on the moral sense of its members than upon an inefficient or unwise code which could not be enforced. Our committee will be guided by your decision; on you rests the responsibility.

In general the same reasoning applies to the matter of the schedule of charges. That some modification is desirable is obvious to all. We cannot hope to have a schedule of charges that will fit with mathematical precision and equal justice all conditions, but we can have a schedule that will form a starting point—and that shall represent a reasonable minimum. It must be a business paper, simple, direct and to the point. It must be self-evident, comprehensive and devoid of argument; inconclusive statements, fugitive suggestions or elusive phraseology have no place in such a document. It must be a basic minimum statement leaving reasonable variations to local adjustment.

That the demands upon the architects both in professional service and in the cost thereof have enormously increased is a well known fact. The schedule when adopted some forty years ago represented fair remuneration for that time, but it does not represent fair remuneration now.

On the subject of competitions there is much to say—and much that had better be left unsaid. Probably 90 per cent of our professional difficulties have grown out of this one fruitful tree of discord. Let me point out, however, the economic side of the question.

The profession is expending vast energy and an enormous sum each year fruitlessly, foolishly, blindly in maintaining this wasteful system. It has been impossible to obtain data or to form anything like an adequate estimate of the cost. We do know, however, of specific instances which

may be quoted as examples. Let me quote only one as typical. The government established a competition within the last year wherein some one hundred and thirty competitors took part, expending in addition to their own time and service, about $65,000. The fees paid to the prize winners and to the expert advisors amounted to about $5000. Loss $60,000. The total gross fee of the successful competitor estimated on a per centum of the proposed cost of the building is about $12,500 and his net estimated profit from this fee about $4500. Net loss to the profession about $55,000. And in the end, I am credibly informed, the jury's award was disregarded and even the plan finally selected had to be revised.

The government refuses to receive from a building contractor any value not required by the contract, without paying for it; and yet—strange inconsistency—the laws or customs are such that it does not hesitate to accept such value from us. The competition system has become so widespread that now it applies not only to government buildings but to all other classes of buildings. I think it would not be too much to say that the architects in this country annually expend over $1,000,000 in competitions from which they receive no return. How long can the profession stand this drain? And this is not all—to foot up the total you must add the profits that should have accrued from time and money expended, the wasted time and effort, the neglect of other duties, the depressing—the disheartening disappointments and the dissensions that ensue. If fault there be, it lies in ourselves. The correction is in our power. The public is eager to understand and ready to accept the professional man's point of view of it—that view—is sane and consistent.

The public does not know, and cannot understand this great waste. It is well that we should understand it and take serious thought.

We have during the past year sought information as to the amount of money expended in building in the United States for a period of years. Inquiry has been made of the authorities of every city in the country of over 20,000 inhabitants. We have asked like information from the Treasury Department and from the Census Bureau. We find that city records are not available in all cases, but have collected such information as they could give us. The Treasury Department's reports are, of course, clear and comprehensive so far as works under its charge are concerned. The Census Bureau could give us no information at all.

With the development of the Institute come larger duties and a natural demand for a larger working capital. Our usefulness is constantly hampered for lack of funds. Our committees have to limit their work by the closest demands of economy, and many useful projects must be neglected for this reason. The Institute should take a greater part in educational work, not only for students of architecture, but for students and apprentices in the lesser arts and in the trades. We could do most valuable work for the world if we could have under our supervision art guilds and trade schools, if we could direct the work of the young mechanic or artisan who labors in the building trades. Give him a knowledge of his art, inspire him to its finer development and you make him a better artisan and a better citizen. Under the patronage of the Institute, lectures, exhibitions, circulating libraries, scholarships, and the like should be established. The Institute should take an active part in research and archeology, in library and museum work and in many other forms of development from which all the people as well as ourselves would derive benefit. But all this means the expenditure of a great sum of money annually. It means an endowment, and a large one; an endowment of which we would be only the trustees, not

the beneficiaries. We cannot look for such an endowment with a selfish end in view, and its acquisition would increase, not lessen, our labors and responsibilities.

In maintaining our place in the professional world, we must not forget that it is the student of today who is the practitioner of tomorrow. We should therefore act helpfully toward the younger men. Share with them our successes, give them their chance as we have had ours, and foster their reasonable ambitions for professional opportunity and success. So win their confidence by generous and helpful acts that they will naturally seek your counsel and be guided by your experience. They will richly repay you by loyal support of those principles and ideals for which you stand. When you receive a young student into your offices, bear in mind that it is your duty to him and to all concerned to see to it that he is fit for the future work of an architect. If you cannot teach him yourself, put him under charge of someone who can.

Give to all the largest opportunity consistent with their ability, but carefully select those who are best fitted by natural inclination and advise the others to seek another occupation. Encourage those who give promise of fitness, but reject the inefficient, the indolent, or the incompetent. And so build up a strong body of practitioners who can be useful to themselves and to the world. To this end then I recommend such action by the convention as will foster and encourage the educational side of our work both in the matter of ethics and design. If this can wisely be accomplished by a closer affiliation with the other societies, or by establishing a junior grade, or grade of aspirants within our own Institute, let us so proceed.

I suggest a closer union of our chapters and a system of correspondence between them. Topics of discussion, such as the arts and the laws and theories of practice, might be arranged in series so that there would be concentration of effort. If the members of the Institute think and work along the same lines they will act as a unit. They will each develop the other. "As one lamp lighteth another and groweth not less, so nobleness enkindles nobleness."

But, above all, remember that we are engaged in a great creative art, and that in the last analysis we stand or fall by our success as creative artists. Let us cultivate, then, that finer side of our lives and maintain those high ideals which have ever made our profession the recorder of the world's progress, the conservator of its rarest treasures, and the creator of its noblest monuments.

At the end you may say with Stevenson, "I know what pleasure is, for I have done good work."

This forceful and comprehensive address was received with the liveliest satisfaction. The broad-minded and dignified statement of the objects and aims of the convention served as the keynote to subsequent deliberations, and in like manner President Gilbert's performance of the arduous and trying duties as presiding officer made possible the large measure of accomplishment.

Other Features of the Convention.

The evening was devoted to the memorial meeting in appreciation and exhibition of works of Augustus Saint Gaudens, by the Institute.

This meeting in its inception, the perfection of its details, and its successful consummation, marks an epoch in the history of the Institute.

It can be truthfully stated that no greater tribute has ever been paid to the memory of an American artist, and the fact that it was conducted by

the Institute to so successful an issue, should be a source of great pride to every architect in America. It was a fitting ending to a year of dignified effort and the committee in charge is deserving of the highest praise.

At the request of President Gilbert, Secretary of State Root presided at the meeting. In accepting, Mr. Root spoke briefly, and referred to having known Saint Gaudens in Rome, some forty years ago. He dwelt in a forceful way on the influence of the work of Saint Gaudens on American art. He then introduced President Roosevelt.

President Roosevelt, who spoke with his accustomed earnestness, said:

"Augustus Saint Gaudens was a very great sculptor. This makes all the world his debtor, but in a peculiar sense it makes all his countrymen his debtor. In any nation those citizens, who possess the pride in their nationality without which they cannot claim to be good citizens, must feel a particular satisfaction in the deeds of every man who adds to the sum of worthy national achievement.

"The great nations of antiquity, of the Middle Ages, and of modern times, were and are great in each several case, not only because of the collective achievements of each people as a whole, but because of the sum of the achievements of the men of special eminence; and this whether they excelled in warcraft or statecraft, as roadmakers or cathedral builders, as men of letters, men of art, or men of science. The field of effort is almost limitless; and preeminent success in any part of it is not only a good thing for humanity as a whole, but should be especially prized by the nation to which the man achieving the success belongs.

"Particularly should this be so with us in America. As is natural, we have won our greatest success in the field of an abounding material achievement; we have conquered a continent; we have laced it with railways; we have dotted it with cities. Quite unconsciously, and as a mere incident to this industrial growth, we have produced some really marvelous artistic effects.

"Again, some day people will realize that one effect of the 'skyscrapers' in New York, of the massing of buildings of enormous size and height on an island surrounded by waterways, has been to produce a city of singularly imposing type, and of unexampled picturesqueness. A great artist will yet arise to bring before our eyes the powerful irregular skyline of the great city at sunset, or in the noonday brightness, and, above all, at night, when the lights flash from the dark, mountainous mass of buildings, from the stately bridges that span the East River, and from the myriad craft that blaze as they ply to and fro across the waters.

"Our success in the field of pure art, as in the fields of pure literature and pure science, has been behind the success we have achieved in providing by the practical application of art and science, for bodily comfort, bodily welfare, and for the extraordinary industrial mechanism which forms the framework and skeleton of our modern civilization. The twilight of letters continues; but much is now being done in the field of art; and Saint Gaudens was an artist who can hardly be placed too high."

The President referred at some length and with much detail of description to Saint Gaudens' work in modeling the new coinage. Standing where his eye could command a view of almost the entire exhibit, he dwelt in vivid description of the impression created by the more important examples of Saint Gaudens' work, and closed his address with the following tribute to his great genius:

"Greatest of all is his Lincoln. Lincoln was the plain man of the people, the people's President; homely, gaunt, ungainly; and this homely figure, clad in ill-fitting clothes of the ugly modern type, held one of the loftiest souls that ever burned within the breast of mankind. It is Saint Gaudens' peculiar quality that, without abating one jot of the truthfulness of portrayal of the man's outside aspect, yet makes that outside aspect of little weight because of what is shown of the soul within.

"We look as Saint Gaudens' mighty statue of the mighty Lincoln and we are stirred to awe and wonder and devotion for the great man who, in strength and sorrow, bore the people's burdens through the four years of our direst need, and then, standing as high priest between the horns of the altar, poured out his own lifeblood for the nation whose life he had saved.

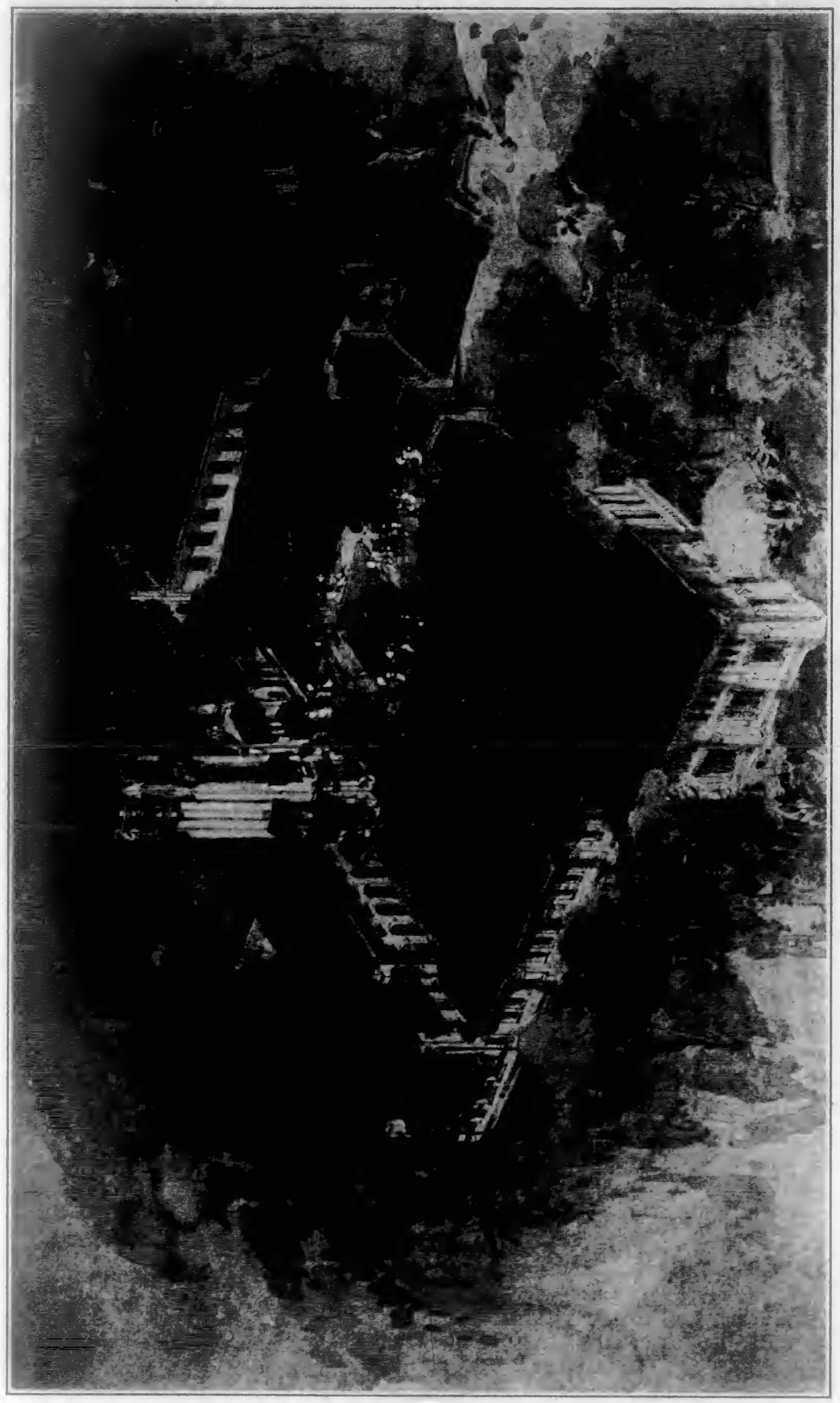
"In this quality of showing the soul, Saint Gaudens' figures are more impressive than the most beautiful figures that have come down from the art of ancient Greece; for their unequaled beauty is of the form merely, and Saint Gaudens' is of the spirit within."

The scholarly address of Ambassador Jusserand, who has many times spoken to gatherings of architects in this country and abroad, received the closest attention and awoke among many present visions of earlier years when they were students in Paris. His appreciation of Saint Gaudens was received with the liveliest satisfaction.

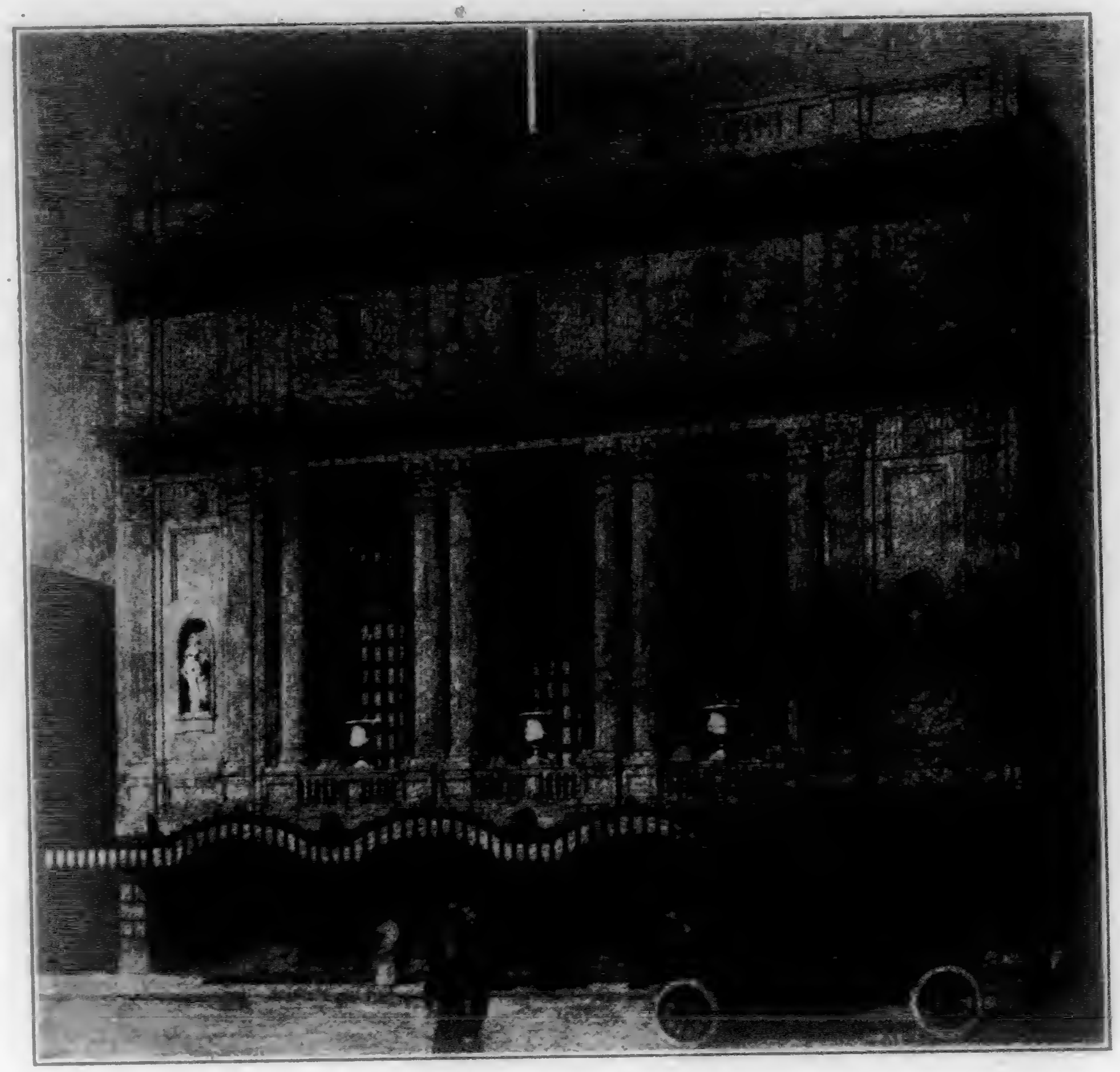
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Dangers of Concrete Construction

IN AN interview given the Washington Herald, Mr. James Knox Taylor, Supervising Architect of the Treasury Department, said, referring to the dangers in the use of reinforced concrete construction: "I would favor the further use of reinforced concrete in the construction of government buildings if it were possible for us to get a sufficient number of expert superintendents to take charge of the work. It requires careful and expert watching. I am afraid that we shall always encounter, or for a long time at least, the same difficulty that we find now in its use, namely that while we can easily get superintendents, we can not get a large enough number of them who are highly trained in the use of concrete. There is too much danger in the indiscriminate use of concrete to permit us to try to make it a common material in the construction of government buildings unless, or until, this danger can be in some way eliminated." Mr. Taylor is the highest functionary in the United States government, as far as building construction is concerned, and his opinion is of great value. In this case, it is simply a reiteration of what so many experts have contended. Reinforced concrete is a most attractive mode of construction theoretically, and splendid results may be attained—from laboratory tests. But it is so variable a quantity and is so susceptible to tribulations in its handling that, spite of the arguments of its votaries, the gentlemen who have cement to sell, it is the most unsafe medium of construction known. All other materials are completed and can be subjected to tests, and are, to a degree, tested in handling before being brought upon a building, while reinforced concrete can only be tested after the structure is completed, when it is usually too late to remedy the defect. The large number of concrete collapses further illustrates this point. Another government officer, Engineer Humphrey, of the Geological Survey (who, by the way, is also the president of a cement organization, which fact gives still greater force to his statement) adds that after an examination of most of these collapsed concrete buildings he is convinced that certain inherent troubles existed in them all, and he fears that similar troubles exist in many that have not yet collapsed, and avers that it seems a miracle to him that more concrete buildings have not collapsed.—Clayworker.



Bird's-eye View of San Jose Normal School
Preliminary Sketch by State Architect Sellon



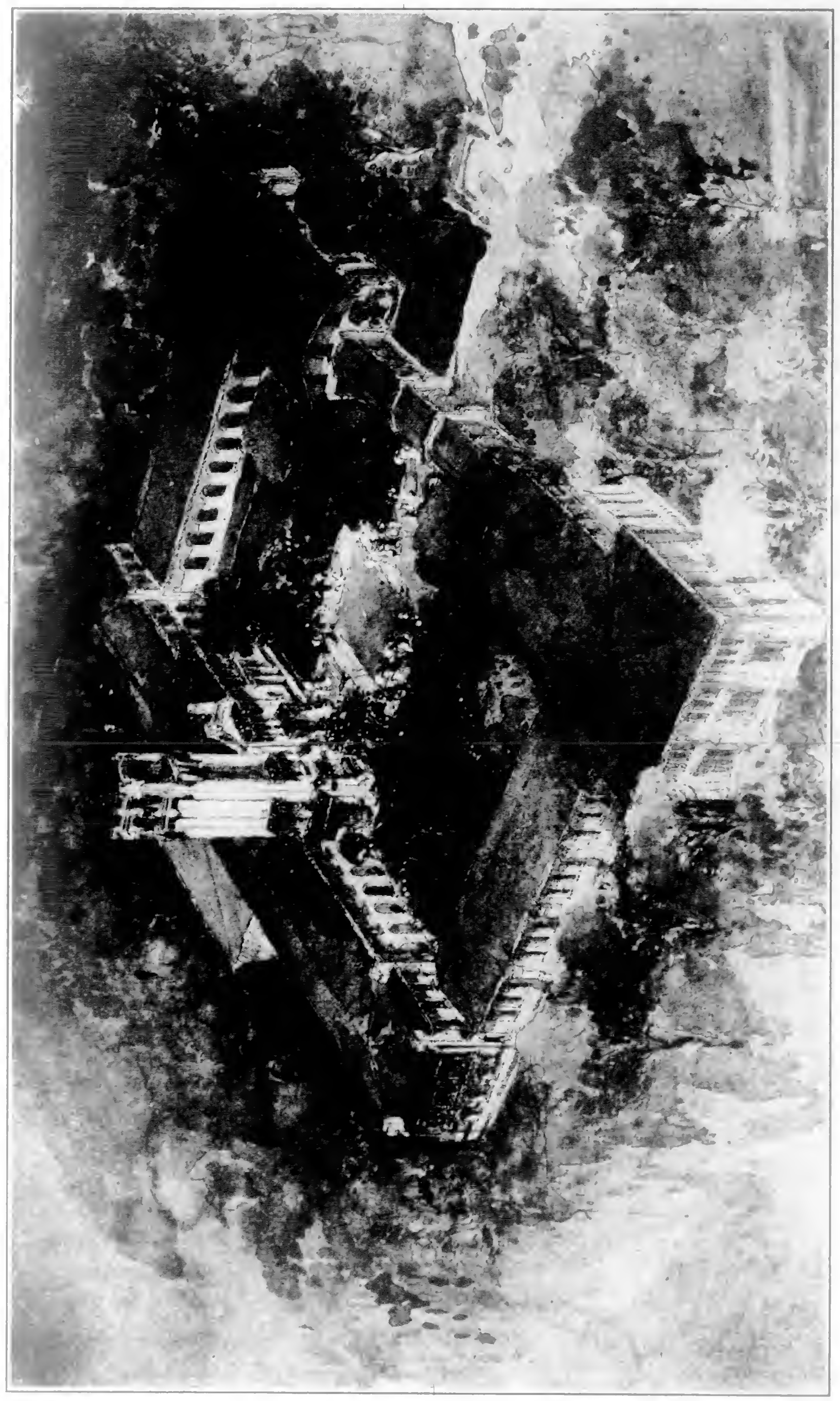
Columbia Theater, San Francisco
Bliss & Faville, Architects

The Columbia Theater Building

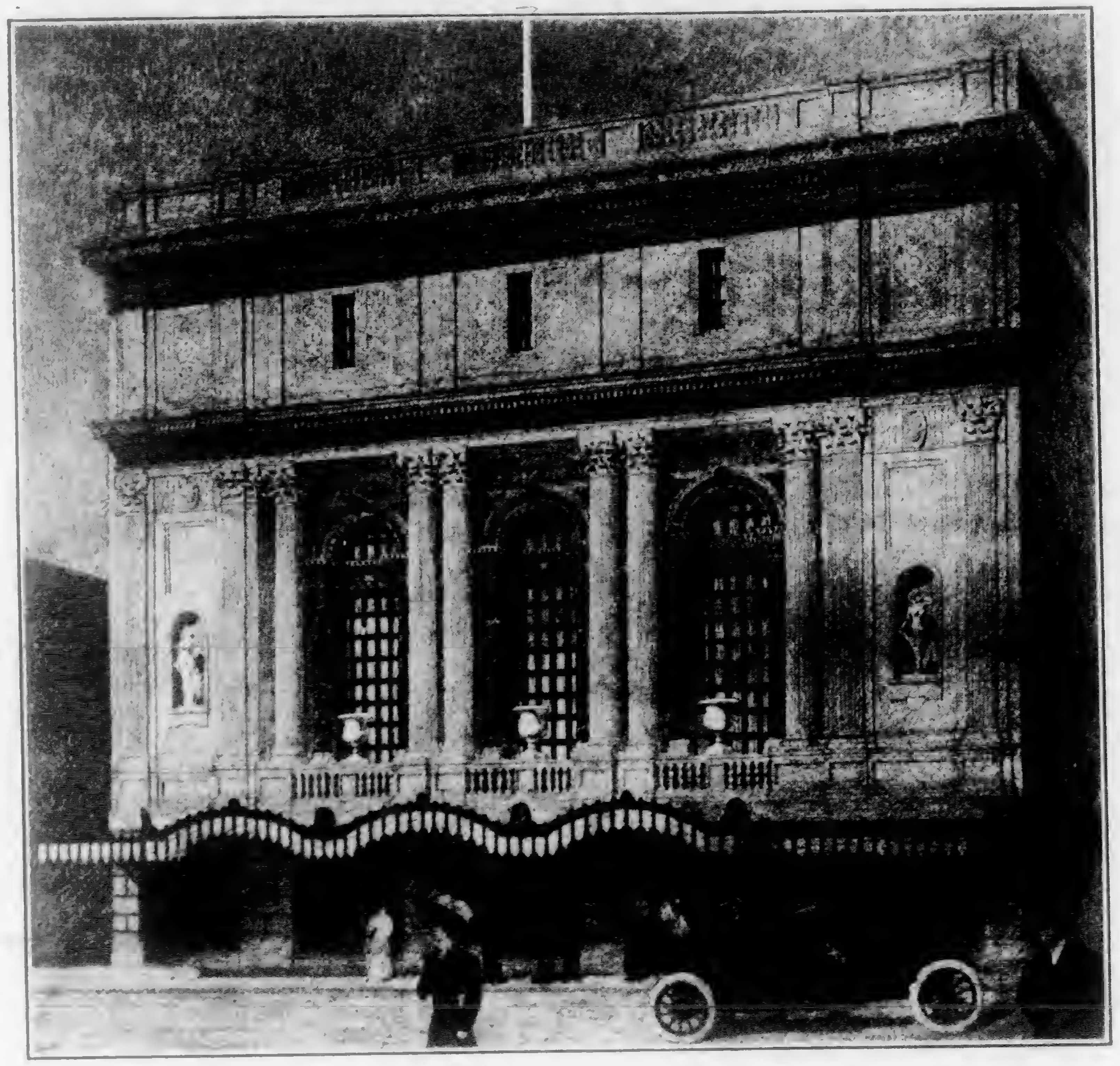
By C. W. WHITNEY.

SAN FRANCISCO was always, and still is, very much of a theater-going center, and with the rebuilding of the city it has been natural to look forward to the erection of permanent theater buildings which not only would serve the ever increasing demands of a drama-loving people, but would also, in architectural design, in facilities for elaborate theatrical productions and in convenience and safety for the public, be a credit to the city. Such a theatre building and more is the new Columbia theatre now under course of erection at the southwest corner of Geary and Mason streets. In its architectural features, Messrs. Bliss & Faville, the architects, have produced very pleasing effects throughout. The main facade of the building, which fronts on Geary street, is to be faced with a special cream-colored pressed brick set off with fluted columns of terra cotta, while a beautiful color effect will be presented to the whole by twisted columns, panels, architraves, urns, etc., constructed of special polychrome terra cotta in four colors.

The theater building proper is a thoroughly fireproof Class A structure with steel frame, fireproofed with concrete. It is 97½ feet wide and extends



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the full depth of the lot, 137½ feet. It is given up entirely to the theater auditorium, stage and the usual ladies' room, ticket office, manager's office, check room, etc., with smoking room and bar in the basement. The ornamentation on the interior is particularly graceful and ornate, the plaster decorations being especially beautiful.

As an annex to the theater building proper, there will be constructed, with a front on Mason street and adjoining the rear of the theater, a brick building which will provide space for dressing rooms, property room and carpenter shop. Ample space will also be provided in this annex for storage of scenery, the scenery room being connected with the rear of the stage by means of openings equipped with automatically closing fireproof steel rolling doors.

The theater will have a large number of exits, opening both on to Geary street and Mason street. The building will have a heating and ventilating equipment, and special attention is also to be paid to the design of the electrical work, the plumbing and other mechanical features. The foyer is to be lined with Utah Caen stone, while the stairs and the floors of the public passages will be of the best grade of Tennessee marble.

The work on the theater, for which the Ransome Concrete Company has the general contract, is now well under way, and before the end of next year it is expected that the building will be entirely completed and ready for occupancy. Messrs. Gottlob, Marx & Company, lessees of the Van Ness theater, will be the lessees of the new Columbia theater. Their long and efficient management of theatrical properties augurs well for the success of the new theater.

* * *

Another very interesting and, in many respects, unusual structure which is now being erected by the Ransome Concrete Company as general contractors, is the half-million-dollar Hotel Sacramento, at the corner of Tenth and K streets, Sacramento. This building is of reinforced concrete construction, four stories, basement and mezzanine floor, and is surmounted by a roof garden. The travelling public have long commented on the need of an up-to-date hostelry in Sacramento and are now rejoicing that this new structure is to meet their expectations so satisfactorily. The construction being reinforced concrete, gives great stability and durability to the building and, moreover, has given the architects, Messrs. Sellon & Hemmings, opportunity for an unusual and specially artistic architectural treatment. Open balconies are to be located on both street fronts of the building, while the roof garden, covered along the street fronts by a pergola of rough-sawn timber construction with red tile roof, will tend to give the building a very pleasing appearance.

In its interior treatment the hotel will have elaborate decorations in the main lobby, lounging hall, dining room, banquet hall, and reception rooms, bar room and grill room. The finish in lobby and public rooms on the first floor is to be of Sienna marble with scagliola columns to match, while the woodwork is to be completed in natural finish jenisero.

The hotel will have upward of two hundred rooms and will be well equipped with elevator service, pneumatic tubes, and other special features necessary for the accommodation of the guests.

A large machinery equipment will provide for the heating and ventilating systems, a vacuum system and refrigerating plant, while the electrical work will be of the latest pattern.

The rough structure of the Hotel Sacramento is now completed, and the contractors are rapidly pushing the work of interior finishing. It is expected that the building will be completed and turned over to the owners about next June.

Two Modern Apartment Houses

MESSRS. OLIVER & FOULKES of San Francisco are the architects of two handsome modern apartment houses now under construction, one in San Francisco and the other in Oakland. The Keystone apartments occupy what is probably the most valuable site for an apartment house in San Francisco. Not only was the fifty vara lot at Washington and Hyde streets selected because of the magnificent and unobstructable marine view, but also because the situation is an admirable one on account of the many street car facilities.

The adopted plan was selected from a number of studies as giving the maximum number of rooms with commanding outlooks, sunshine, etc., and each of the ten apartments to a floor are located in separate pavilions, thus obtaining the greatest possible privacy under a single roof.

The building, which is six stories high, is pure colonial in design and has the usual effect of solidity and grace which this style so well affords.

The interior is elegant, homelike and wonderfully convenient.

The fundamental conception of an apartment house is a combination of the usual comforts and conveniences of a well-appointed residence, a central location, and all at a reasonable rental.

Each apartment is equipped with an electric lift of automatic control, a circulating brine system of refrigeration for each pantry, dish washing machine, private laundry with clothes dryer and a suction plant for the disposal of dust.

A safe deposit vault with separate boxes for each apartment is located on the first floor adjacent to the office.

Sun parlors, billiard rooms, ladies' parlor, a general lounging room, social hall, children's play room, an attractive tea garden on the roof, all add to the comfort and entertainment of the guests.

Similar to the Keystone in many of its appurtenances is the Peralta apartment house being built for Drs. Huntington and Dow at Thirteenth and Jackson streets, Oakland. The design is on the Spanish order. The building will be six stories high, 120x130 feet and will cost in the neighborhood of $200,000.

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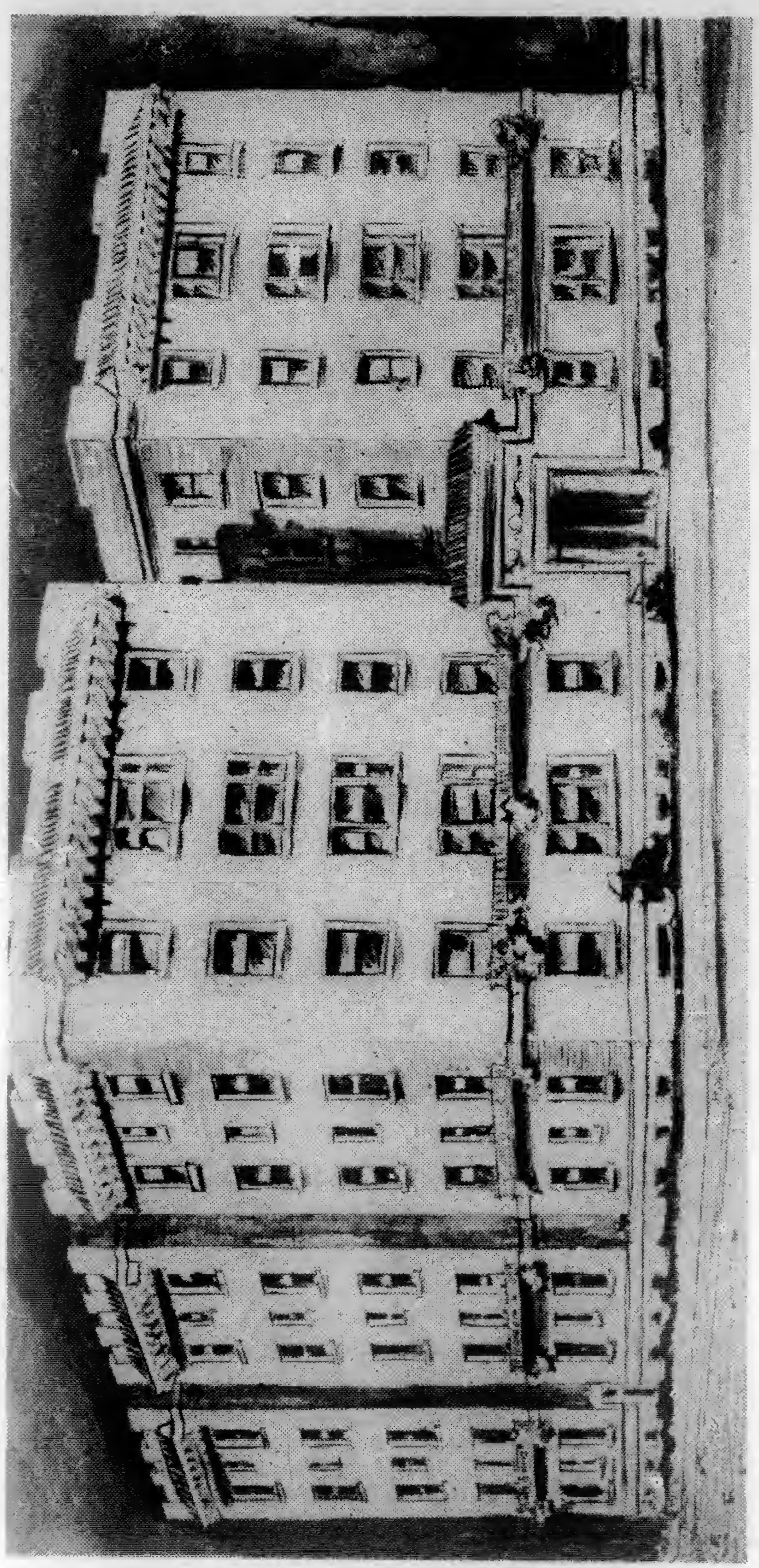
The Treatment of Ceilings

Some of the world's greatest artists have been employed from time to time in painting ceilings. Michael Angelo, much against his will, it is said, painted very elaborate decorations on one of the ceilings of the Sistine Chapel, and in the last century it was very common to have medallions and panels painted on canvas, which was attached to ceilings. In Stafford House, London, there is an elaborately painted ceiling in one of the rooms, which is reflected in a mirror placed in the center of the apartment. Owen Jones, in speaking of the decoration of walls, says: "One of the first principles to be attended to is that nothing should disturb their flatness; all direct representations of natural objects should be avoided; first, because they place those objects in unseemly positions; secondly, that the paper should serve as a background."

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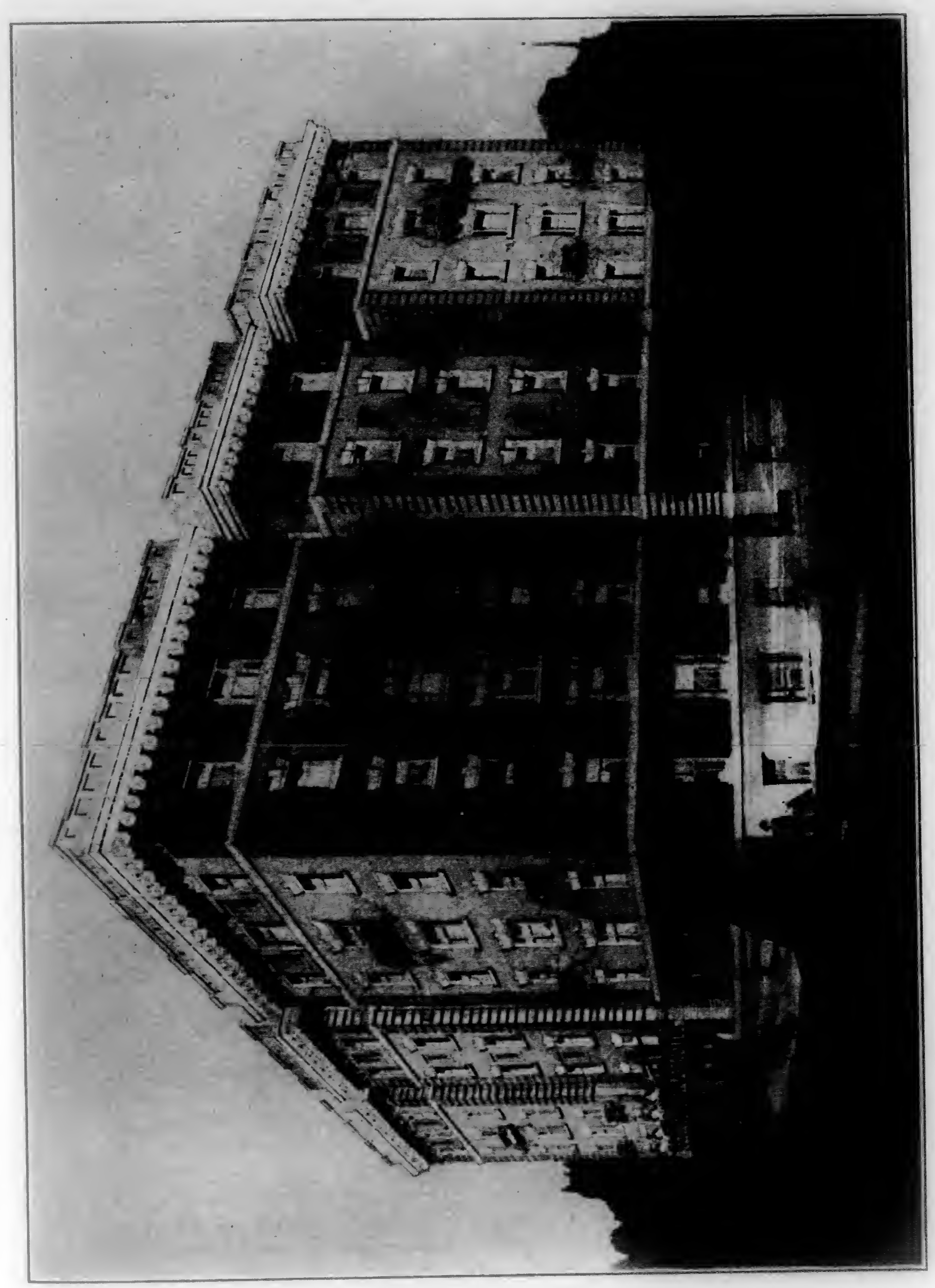
Superiority of Brick Over Stone in a Fire Test

The recent $35,000 school building fire, at Springfield, Minn., offers convincing evidence of the stability of brick under the severe fire tests. The standing walls are all that is left of a once handsome structure. These walls are of brick and an examination of the ruins shows that the intense heat did not cause the walls to crumble nor the brick to crack. All the stone in the building which came in contact with the heat was badly cracked or entirely disintegrated.



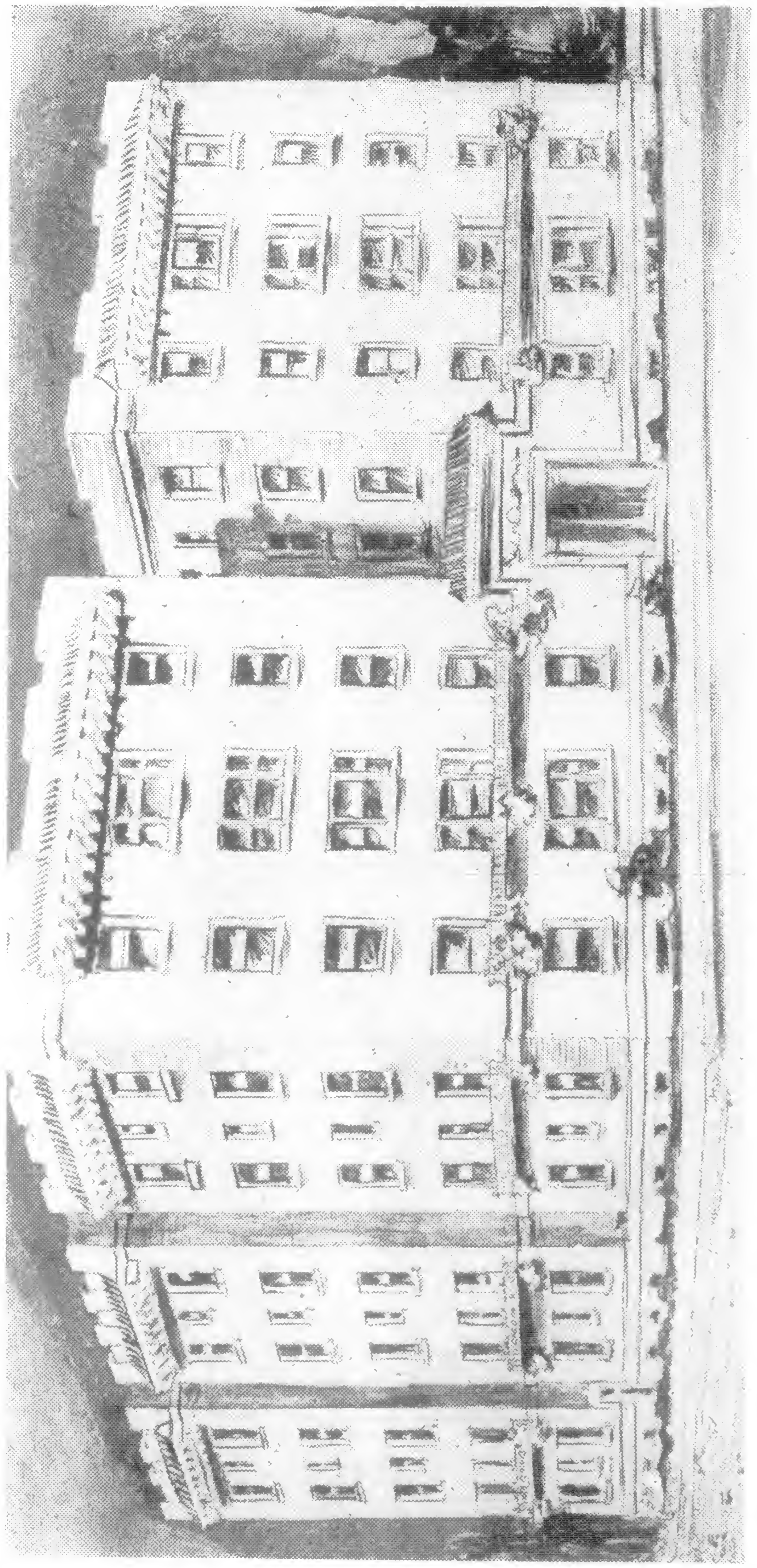
The Peralta Apartments, Oakland
Oliver & Foulkes, Architects

Equipped with Van Emon Elevators



The Keystone Apartments, San Francisco
Oliver & Foulkes, Architects

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Graff Building, San Francisco
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Watering the Horses near the Donahue Fountain at the Trough Erected by the S. P. C. A. Society

San Francisco's Lack of Drinking Fountains

By HORATIO F. STOLL.

"HERE'S to Miss Lotta," said a merry-faced tar the other day at Lotta's fountain as he raised a cup of water to his lips and nodded to his sailor friend.

"Lotta?" queried his companion. "Who's Miss Lotta?"

"Search me," laughed the seaman, as he smacked his lips and proceeded to turn on more water. "But I'll bet she's a good fellow. She gave this fountain to 'Frisco."

"Who said so?" snapped the other.

"Why, can't you read? Says so right here." And with that he pointed to the inscription.

I thought they might be glad to know the lady's identity, so, while they drained several cups of water, I explained that Lotta was Lotta Crabtree, the actress, one of the darlings of the early theatrical days, but now retired and wealthy.

"Well, she's all right, all right," commented the amiable tar. "She's made a hit with me. I've been looking for this kind of an outlay ever since I landed." And he added as a compliment: "Your water's all right, too. No more typhoid germs, I hope."

I was amused, for I had been told that the man behind the gun scorned mere water when he was on shore leave, and I said as much.

"You're off there, son," corrected the sailor. "Booze is all right for a couple of days after being at sea for a long time, but the boys tire of it quicker than they do of water. Of course, some of them are like sieves and can't ever get enough. But the majority ain't so stuck on booze. Water's good enough. We drink buckets of it."

I could readily believe this statement when I watched him drain several cups of water.

"Why, I've guzzled more different kinds of water—and booze, too, for that matter," he went on, "than you could shake a stick at. We've had it luke warm and cold as ice; brown as chocolate and clear as crystal; we've had the pure unadulterated and we've had some that looked like an aquarium; we've had it sweet, tasteless, salty. We've sampled water from hundreds of rivers, lakes, springs and fountains. We've tasted condensed water from every ocean and bay in which our vessel has floated. Oh, you can't tell us anything about water. We're as good judges of water as we are of beer or whiskey!"

"Too bad we haven't more fountains," I ventured. "Perhaps you sailors might drink more water and less booze."



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"Too bad we haven't more fountains," I ventured. "Perhaps you sailors might drink more water and less booze."

"Sure, Mike," answered the other seadog, as they locked arms and proceeded up the street.

My attention having been drawn to the fountain, I watched to see how many people stopped to quench their thirst and then I began to speculate as to how many people had been benefited by this fountain alone.

It was during one of her most successful engagements in San Francisco, away back in 1874, that Lotta Crabtree, the favorite of the old theatrical days, conceived the idea of presenting the city of her youth with some testimonial of her appreciation and concluded that she could select nothing better than a drinking fountain.

Owing to theatrical engagements in the East, she was unable to be present at the dedication ceremonies on September 9, 1875, so Harry Edwards, a popular actor of the time, delivered the speech of presentation. In the course of his remarks he said:

> In the older countries of Europe, public drinking fountains are of frequent occurrence and the inscriptions upon them are often quaint and characteristic. They have formed themes for the antiquarian and the poets; they have employed the pencils of artists. But, built of perishable materials, many of these interesting structures are fast falling to decay, the very names of their builders being lost in the passage of time. This can hardly share their fate—the solid iron fabric must last and survive the ruins of centuries and the name of the kind-hearted actress will be repeated by thousands who will in the far distant future experience the benefit of her thoughtful deed.

Thirty-three years have slipped by since the covering over the fountain was removed and Miss Crabtree's aunt, Mrs. Vernon, was first to receive a drink. San Francisco then had about 250,000 inhabitants. Today she claims to have twice that number. Supposing that only five hundred people each day have availed themselves of the opportunity to drink from the four cups provided, it would mean that more than five million people have accepted the thoughtful hospitality of Lotta. This is a low estimate. It is probable that ten times that number have stopped at the fountain and quenched their thirst.

Freshly painted in honor of the coming of the fleet, Lotta's fountain, at the corner of Market and Kearny streets, looks as attractive and substantial as the day it was accepted in behalf of the city by Mayor James Otis. Neither time, earthquake nor fire have left their imprint, and it seems safe to repeat Mr. Edwards's prophetic words that this fountain will "survive the ruins of centuries."

Somewhat more pretentious is the Admission fountain presented by James D. Phelan to his native city, and dedicated to the Native Sons of the Golden West on September 9, 1897. It is advantageously situated at the intersection of Market, Turk and Mason streets, and, like all the other fountains and groups of statuary, withstood the effects of the great conflagration wonderfully well. In the excavation for this fountain, by the way, it was found that a large sewer was immediately beneath, which necessitated the deepening of the hole to about ten feet and laying solid walls of broken stone and cement on both sides of the sewer and over it. The first flight of steps arising on that foundation covers an area of fifteen feet square. The monument with the winged figure on top measures 35 feet in all from the ground upward and is beautifully proportioned.

The bronze studies ornamenting the fountain were designed by Douglas Tilden, and are four in number. Surmounting the top is an allegorical figure of history—a female posing herself on a bronze globe with outspread wings and holding above her head an open book on which is inscribed the words: "Sept. 9, 1850," the date California was admitted to the Union. Standing on the granite pedestal against that part of the column facing Market street is the



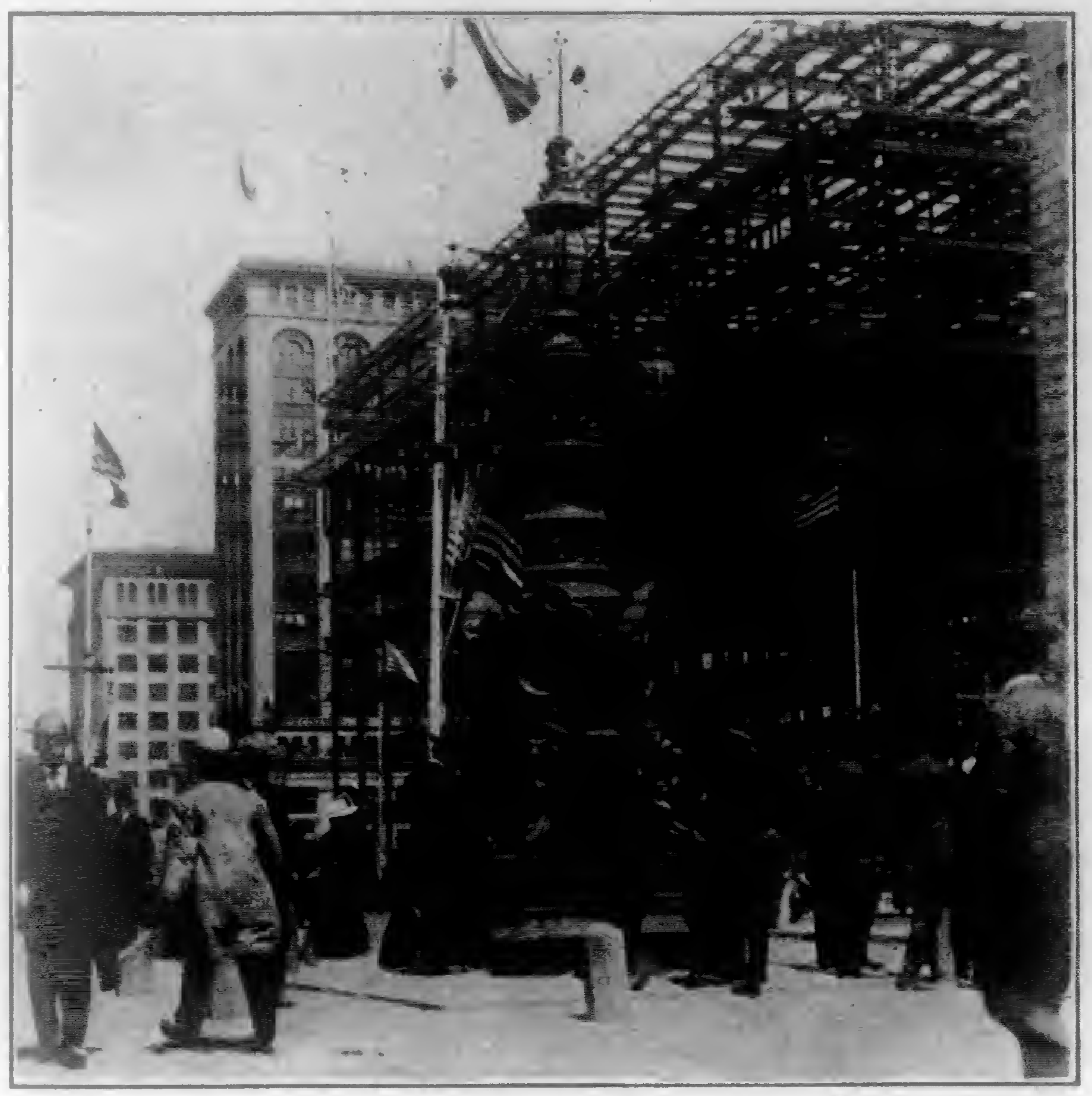
A Selfish Driver Quenching his Thirst at the Phelan Fountain while his Horses are Overlooked

statue of a young miner. He is garbed in the dress of the pioneer days with the inevitable soft hat, woolen shirt, top-boots and pistolbelt. He unfurls a flag with the left hand and shouldering a pick with the other seems to be stepping forward and shouting the good news at the top of his voice. Two bear skulls at the sides of the pedestal are entwined with rattlesnakes and symbolize the Sierras, where lies the Hetch-Hetchy Valley, from which, it is hoped, we will some day obtain a supply of pure mountain water. The skulls hold between their teeth handles which release the water that spouts out of the heads of the snakes into basins and thence into pools below for the use of dogs.

Douglas Tilden also designed the Donahue fountain, which stands at the intersection of Battery, Market and Bush streets. It is said that the sculptor made various more or less conventional designs with which he could not satisfy himself until, in passing one day a machine shop, he caught a glimpse of workmen operating a large lever punch. This gave him the motive which he extended into a striking design in bronze and granite.

Peter Donahue, whose memory was the inspiration of this gift, was a machinist by trade, who came to San Francisco a pioneer in 1849, and established the Union Iron Works almost within a stone's throw of the spot where the fountain now stands. The memorial was erected under the will of his son, J. Mervin Donahue, and was dedicated to the mechanics of San Francisco. The unveiling took place during the visit of President McKinley, on May 15, 1901, but, owing to the illness of his wife, the President was unable to attend the ceremonies.

Of the down-town fountains, this is the only one where one has a chance to see the water play in the air and hear it splash as it hits the granite base and falls into the large basin. It performs a pleasant function in bringing into busy Market street that sound of running water which, in its idle play, its music



Lotta's Fountain. San Francisco

reminiscent of the woodland stream, has in the city so rare a power to charm. It has been well said that something about us, some lingering touch, perhaps, of the primitive days, gives to the running water of the city fountain that relation to public life which the fire in the open hearth has to private life. To appreciate this to the full extent, the fountain should be in a square or park where one has leisure to sit before it. But even in the roar of the city, the fascination of its music is not lost.

It is a pity in planning the Donahue fountain some provision was not made for horses and dogs. Had the circular walk been eliminated and the level of the water in the basin been slightly raised, horses might be driven to the edge and drink to their heart's content. And by adding shallow pools about the sides, the street dogs could have been accommodated as well. As it is, the fountain is ornamental, not useful.

The other day I saw a thirsty little dog jump from a truck and scamper over to the fountain. Standing on his hind legs, he craned his neck over the coping in a vain endeavor to get some of the precious water; but it was just out of his reach and he had to content himself with lapping up some of the water that feebly trickled over the cement walk into the gutter. These leaks, by the way, occur where the granite blocks in the coping are joined. They are doubtless due to the earthquake and could easily be patched with a little cement. It should be done at once, as it gives the sidewalk a damp and untidy appearance.

No sooner had the little dog returned to his seat on the truck than a



The old Cogswell Fountain which stood at the corner of Market and California Streets. San Francisco



The Robert Louis Stevenson Fountain, in Portsmouth Square, San Francisco

chirping sparrow hopped up on the coping. I was glad to see one of these husky feathered street urchins down town again, and so I watched him closely. He wiped his little bill carefully on the granite, and, with a flutter, alighted on one of the spouting dolphins. Then he sipped deeply from the gushing waters. How he seemed to enjoy it! Slowly he raised his pert head skyward, allowing the soothing liquid to run down by degrees and tickle his little insides. He repeated the performance several times. Fortunate little sparrow! I could not help wishing that the faithful little truck dog also had been provided with wings or that the cracks in the coping were larger so that sufficient water could run into the gutter to satisfy his thirst as well.

What a valuable service the Donahue Fountain might have performed during the early reconstruction days. Instead of lying idle for nearly two years, it might have been cleaned and filled with water for the use of the hundreds of thirsty horses that, shortly after the fire, were put to work clearing the streets and debris-strewn lots. Those who worked in that section will never forget the brick and lime dust that parched their throats, but the greatest sufferers were the horses, many of which were not able to obtain water from the time they left their stables in the early morning until their return at night.

Improvised water troughs made of iron bath tubs taken from the ruins and placed under hydrants provided water for a few horses, but relief was not felt until George Renner, of the Draymen's Association, superintended the erection of several water troughs. These troughs were twenty feet long, elevated three and one-half feet on wooden posts, and were the means of relieving much suffering. There still being a large area where teams could not obtain water, the Society for the Prevention of Cruelty to Animals, upon the suggestion of Mr. Renner, immediately ordered eight troughs similar to those of the Draymen's Association and the Board of Public Works cheerfully granted a permit allowing them to be erected at Market and Battery, Bay and Kearny, Eighth and Townsend, Van Ness and Union, Fourth and Jessie, Kentucky and Fourth, Kentucky and Twentieth, and in front of the Society's office on Sixteenth street.

These wooden troughs have gradually been replaced by new troughs planned by Secretary McCurrie, the result of many experiments and built with the purpose of standing the severe jolts of large trucks. They cost $75 each, and are twelve feet long, twenty inches wide and six inches deep, with a six-inch channel iron guard rail bolted to steel arms connected with the steel upright posts. The posts are made of ten-inch steel pipe filled with concrete and set in concrete three feet under water. A space of three and one-half feet from the pavement to the bottom of the troughs allows the poles of wagons and trucks to pass under without striking. An automatic valve enclosed in an iron box two feet long by six inches wide and ten inches high in the center and back of the trough, allows space for drinking along the entire twelve feet of the trough. The Society pays $5 a month for the water supplied for each of these troughs.

It is doubtful if any of these troughs are more used and appreciated than the one located to the east of the Donahue Fountain. All day long you will see trucks, wagons and buggies drawn up in front of it. At the noon hour I have counted as many as a dozen drivers watering their horses at this trough. In order not to lose time, the driver generally fills his bucket and waters his horses in that way. And if he is one of the thoughtful kind, you will see him hold the bucket up to the little dog on the seat. The horses delight in the troughs. It would do your heart good to see those handsome big truck horses plunge their warm, dusty noses to the bottom and draw in the water thirstily.

The drivers appreciate the convenience of watering their horses without having to uncheck them. Some, I am sure, who are in a hurry, would not take the time or trouble to uncheck them; others are glad of the chance to alight while their horses are watering, and take a drink themselves from the agate cup that hangs from the hydrant at one end of the trough. The Society finds it can often get thoughtless drivers to be considerate to their horses if some inducement is held out to them. Hence the tempting agate cup.

One of the sections of the city where a fountain for horses is most needed is down on East street, where from morning until night there is a continual procession of trucks and other vehicles. It looked for a while as if the Outdoor Art League were going to secure one of the Herman Lee Ensign fountains for this section of the city, but owing to the fact that it required quite an area to meet the conditions stipulated by the donor—there must be twenty-five feet, the length of a horse and wagon, about the fountain—the Harbor Commissioners did not see their way clear to set aside a suitable site, and so the matter has temporarily been allowed to drop. However, any time we can provide a location where there is a large passing traffic, one of the Ensign fountains can be had for the asking.

Los Angeles possesses one, Pasadena has two, and only recently one has been erected in Oakland, at the corner of Twenty-Sixth and Broadway, through the efforts of the Woman's Civic Club. They are plain, practical fountains of Maine granite, entirely polished and trimmed with bronze, and cost about $1,000. They weigh five tons and stand six feet high. From jets springing from the heads of miniature lions, the water falls into a large circular drinking pool for horses four feet above the ground. Small basins at the base, with constant running water, are supplied for dogs.

When he died a few years ago, Herman Lee Ensign left a large fund to be used in the erection of these fountains in every city in the Union. From childhood he was a great lover of horses. To him animals were not mere inferiors and slaves; they were companions and friends devoting themselves to man and depending upon him for their lives and welfare. He founded the National Humane Alliance of New York to carry out his ideas, and today they are distributing his fountains in accordance with his wishes. The railroad companies have been good enough to transport them free of charge all over the country, and the only expense to the Outdoor Art League, if one of these fountains is secured for San Francisco, will be the cartage from the freight car on its arrival and the expense of putting in good water connections.

Unless some public-spirited citizen thinks he would like to give San Francisco a more pretentious fountain for a Christmas present, it seems to me that an excellent location for one of these Ensign gifts would be the triangular space at the corner of California, Drumm and Market streets, where the large flagpole now stands. There are a dozen corners along Market street where this flagpole might be installed—at Grant Avenue, Post, Sutter, Front or Davis streets. But there are few available open spaces along the city's main artery of traffic that are sufficiently large to show off an ornamental group of statuary or to meet the requirements of an Ensign fountain. The tall Santa Marina, Boyd and Luning buildings give this corner a very stately appearance and they would serve as an excellent setting for such an addition.

Years ago this triangular space was ornamented (?) with a statue of Dr. H. D. Cogswell, who had a weakness for seeing his likeness set up in public places. It is said he ordered as many as a dozen duplicates of this statue at one time. How he succeeded in having this common-place replica of himself erected in this particular location, no one has ever been able to explain to me, although the drinking cups for passers-by and the pools below for dogs were certainly very welcome. But from an artistic standpoint the whole thing was in bad taste.

From time to time all kinds of protests were made to have the statue removed. It was argued that this inartistic piece of statuary created a poor impression on strangers who saw it immediately after they entered the city. However, nothing was done. Finally, one dark wintry night, a number of indignant art lovers, after the manner of the Vigilantes of old, decided to take the matter into their hands. They lassoed the doctor with a stout rope and tried to pull him from his pedestal. But the donor had intended that his statue should also "survive the ruins of centuries," and he anchored it good and fast. For hours the conspirators tugged and swore and fumed and strained, but they succeeded in bringing down only a part, an arm, I believe, when the first gray streaks of dawn overtook them. Then the city authorities determined that, since no one wanted to see the arm restored, and the doctor looked absurd without that necessary appendage, it was best to remove him. This was done quietly and a flagpole substituted.

Cogswell, by the way, did better by the city when he presented the Benjamin Franklin drinking fountain which now stands in the center of Washington Square. It was originally set up at the intersection of Kearny street and Montgomery avenue, where the new Ruef building now towers. The bronze statue of Franklin is six and a half feet high and was cast in New York at a cost of $5,000. On one side of the granite pedestal is the inscription, "Presented by H. D. Cogswell to our Boys and Girls Who Will Soon Take Our Places and Pass On." Over the faucets are "Vichy," "Congress," and California Seltzer," a pleasantry on the part of the donor, who, by the word "Welcome" cut on each of the three sides of the stone platform under the dogs' drinking basins, invited man and beast to refresh themselves. Years ago it was deemed best to remove the fountain to Washington Square, a few blocks away, where it has been much enjoyed by the idlers and residents of North Beach. As soon as the city's water supply was turned on after the great fire, this fountain proved a great convenience to the refugees who remained in the park over a year.

Another fountain that will always be gratefully remembered by the refugees is the Robert Louis Stevenson fountain in Portsmouth Square. Thanks to the thoughtfulness and energy of Bruce Porter and a number of Stevenson admirers, San Francisco was the first city to erect a memorial to the much-beloved novelist. The writer spent many an idle hour in the old plaza watching and studying the various types and nationalities passing in review before him, and so it was considered the most appropriate place for the fountain. The monument cost $1,500, and consists of a massive rectangular granite base ten feet high, in which a watertap is inserted. It is surmounted with a bronze figure of a Spanish galleon under full sail, designed by George Piper. On one side is inscribed the following words of Stevenson:

> To be honest; to be kind; to earn a little; to spend a little less; to make a family happier for his presence; to renounce when that shall be necessary and not be embittered; to keep a few friends, but these without capitulation; above all, on the same grim condition, to keep friends with himself—here is a task for all that a man has of fortitude and delicacy.

It might be well for some of our wealthy citizens who have accumulated fortunes in San Francisco to ponder over these words of Stevenson. Perhaps it may influence them to return something to the city that has contributed so much to their happiness and prosperity. If they want to show their appreciation, their gratitude, they could select no better gift than a drinking fountain in the down-town district. It will add beauty to the rehabilitated business section, contribute to the comfort of their fellowmen, quench the thirst of beast and bird, and stand as an imperishable monument to the kindly spirit and generosity of the big-hearted donor.



Vitrified Brick Pavement, Fourth Street, Los Angeles

Brick Street Pavements*

By WILL P. BLAIR, Secretary of National Association of Paving Brick Manufacturers, Indianapolis, Ind.

THE use of vitrified brick or block for streets and roadways is an American idea, which originated about thirty years ago. It was developed from the use of brick made from the ordinary surface clays for such purposes in a few of the smaller cities of Indiana and Illinois. Shortly afterwards brick made from fire clay in the upper Ohio valley were used for a like purpose.

It will probably never be established as to who made the first vitrified brick from shale in this country. One thing is certain, that the first stiff mud brick made from a mixture of shale and common clay were produced in central Illinois. These were used for street paving purposes and naturally followed the use of the common brick for street paving, and thus, more by accident than design, such brick were found to resist the wear of travel with greater success than the brick made from the surface clays, and thus the value of vitrified brick for paving purposes was established.

In like manner, it may be truthfully said that for many years following the earlier manufacture and use of paving brick, progress toward betterment was, to a very great extent, merely incidental. The extended use for street paving purposes was slow. Few of the earlier manufacturers, if any, realized the development about to take place, and very few of the manufacturers had any concern of the relation their uses bore to the importance of the business.

The demands for the product, however, grew continuously, regardless of the fact that so few were giving any attention whatever to their proper use as

* Extracts of a paper read before the American Society of Municipal Improvements.

a street paving material. Finally, some few of the manufacturers began to realize that the lack of appreciation of brick streets was due to the fact that they were almost universally built without consideration, either as to the physical advantage, insuring durability, or in a manner making possible the greatest satisfaction to the user. The few, however, whose eyes were opened to the facts, began a careful study and inquiry into the methods of construction promising to afford the greatest satisfaction possible from every standpoint.

A few engineers in the central west early realized the importance of proper construction, and appreciated more than the manufacturers what the future had in store for vitrified brick. These engineers and these manufacturers, while maintaining the value of the use of a good quality of vitrified brick for street construction, were convinced of the utter folly of depending upon that alone, and saw that other elements were equally necessary. It is not too much to say that even now the brick are too often required to bear the burden for a satisfactory street. Neither is it putting it too strong to say that the criticisms offered against brick streets are due, in nine cases out of ten, to other causes than the quality of the brick.

In the month of July of this year, we had the opportunity of examining the brick street in more than fifty cities of the Allegheny mountains. We were greatly surprised that in but three cities did we find the essential details of brick street construction at all complied with. Many of the details of a properly constructed brick street seem not to have found lodgment with those who are charged with their construction, as being in the least degree important; they are, nevertheless, absolutely necessary for the construction of high class brick pavements.

The following practices have come under my observation: I have seen the filler dipped from the mixing box with a bucket and carried many steps. In such case, the sand was on its way to the bottom of the bucket and the cement was making for the top. I have seen the mixture placed in a cradle or rocking box, and in the time intervening the turning of the box, the sand and cement were undergoing a like separation, and as the box was turned the richer mixture of cement flowed ahead and the weaker and sandy portion remained near the box. I have seen the water applied before the mixture in a dry state reached an even shade, thus preventing the proper adhesion of the particles. To remedy the thickening of the mixture, I have seen it entirely ruined by throwing upon the street the water from an open nozzle, which served only to float the cement away from the sand. I have seen the mixture put upon the street much faster than it could be swept in. I have seen the mixture prepared in a dry state in large quantities at intervals of a few feet upon the brick and the water applied and the sweeping-in process undertaken simultaneously. I have seen the mixture made up in such large batches that it required a sweeping of several feet before it could be made to disappear in the interstices. In such cases, the last that went in was but very little better than pure sand. I have taken a quantity of sand from the supply to be used for filler purposes and found that it contained 33 per cent. of soil. I have seen, by the use of the same kind of broom in the application of the second course as was used in the application of the first course, the filler swept out of the joints rather than left full and flush with the top of the brick, thereby insuring slight shipping of either edge of the brick in the early use of the pavement. The mere exercise of common sense would suggest the use of a rubber or leather scraper for the application of the top course, and the stroke at an angle of forty-five degrees to insure the perfect job. Thus, I might enumerate for hours the manner, method, and means of applying the cement filler in the interstices of a brick street, each and every one of which was but



Vitrified Brick Pavement, Winslow Street, Los Angeles



Vitrified Brick Pavement, Seventh Street, Los Angeles

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A few engineers in the central west early realized the importance of proper construction, and appreciated more than the manufacturers what the future had in store for vitrified brick. These engineers and these manufacturers, while maintaining the value of the use of a good quality of vitrified brick for street construction, were convinced of the utter folly of depending upon that alone, and saw that other elements were equally necessary. It is not too much to say that even now the brick are too often required to bear the burden for a satisfactory street. Neither is it putting it too strong to say that the criticisms offered against brick streets are due, in nine cases out of ten, to other causes than the quality of the brick.

In the month of July of this year, we had the opportunity of examining the brick street in more than fifty cities of the Allegheny mountains. We were greatly surprised that in but three cities did we find the essential details of brick street construction at all complied with. Many of the details of a properly constructed brick street seem not to have found lodgment with those who are charged with their construction, as being in the least degree important; they are, nevertheless, absolutely necessary for the construction of high class brick pavements.

The following practices have come under my observation: I have seen the filler dipped from the mixing box with a bucket and carried many steps. In such case, the sand was on its way to the bottom of the bucket and the cement was making for the top. I have seen the mixture placed in a cradle or rocking box, and in the time intervening the turning of the box, the sand and cement were undergoing a like separation, and as the box was turned the richer mixture of cement flowed ahead and the weaker and sandy portion remained near the box. I have seen the water applied before the mixture in a dry state reached an even shade, thus preventing the proper adhesion of the particles. To remedy the thickening of the mixture, I have seen it entirely ruined by throwing upon the street the water from an open nozzle, which served only to float the cement away from the sand. I have seen the mixture put upon the street much faster than it could be swept in. I have seen the mixture prepared in a dry state in large quantities at intervals of a few feet upon the brick and the water applied and the sweeping-in process undertaken simultaneously. I have seen the mixture made up in such large batches that it required a sweeping of several feet before it could be made to disappear in the interstices. In such cases, the last that went in was but very little better than pure sand. I have taken a quantity of sand from the supply to be used for filler purposes and found that it contained 33 per cent. of soil. I have seen, by the use of the same kind of broom in the application of the second course as was used in the application of the first course, the filler swept out of the joints rather than left full and flush with the top of the brick, thereby insuring slight shipping of either edge of the brick in the early use of the pavement. The mere exercise of common sense would suggest the use of a rubber or leather scraper for the application of the top course, and the stroke at an angle of forty five degrees to insure the perfect job. Thus, I might enumerate for hours the manner, method, and means of applying the cement filler in the interstices of a brick street, each and every one of which was but



Vitrified Brick Pavement, Winslow Street, Los Angeles



Vitrified Brick Pavement, Seventh Street, Los Angeles

to insure a failure, and in none of which is economy to the contractor subserved.

I might enumerate for hours the manner, method, and means of applying the cement filler in the interstices of a brick street, each and every one of which was but to insure a failure, and in none of which is economy to the contractor subserved.

By the proper method, here insisted upon, the hoes are drawn by two workmen to the upper portion of the box and the backward flow agitates the mixture equally with that of the stroke. The lift of the scoop immediately following, the box sufficiently adajacent to the work, so that instead of a motion which pitches, it is rather a quick motion on the part of the workmen that pulls from under the mixture the scoop, allowing the mixture to strike the surface of the brick in proper proportion, thus more nearly insuring it in place in proportion than by any other known method. By the use of three boxes and a systematized force, the greatest economy to the contractor is subserved and the greatest possibility of the cement filler is attained.

The boards in place providing for the cushion should, after a lapse of twenty-four hours and sooner than thirty-six hours, be withdrawn, and the space filled two-thirds with a pitch filler. Then finally a covering of sand, sufficient to hold moisture and protect the cement filler from extreme heat while setting, is imperative.

The principal reason why we cannot get a more universal compliance with the approved methods of constructing brick streets is due to the American political practice of awarding minor political service by the dearest compensation possible to lay hands upon. In many cases, the man secures an inspectorship because he is fit for nothing else. The miserable practice should cease. More money is expended for streets and roads than for any other public purpose, except for the education of our children.

The architect, who plans, designs, and specifies concerning the expenditure of $50,000.00 in a building, is permitted to hire, train, and direct his superintendent. It is the exception to the rule if the municipal engineer in this country is permitted to do this thing. It should be part of the engineers' business, as much to select his superintendent and inspector as it is to design and specify. This question is one that does not relate alone to the construction of brick streets, but it permeates, relates to all municipal work, and is the one objectionable feature in the prevailing American municipal system toward accomplishing the elimination of which every broad-minded citizen and taxpayer should lend his influence.

* * *

The Mission of Mortar

Two Irishmen were looking at bricklayers busily working. "I say, Pat, kin yes til me what kapes them bricks together?" asked one.

"Sure, it's the mortar, Mike," was the answer.

"That's where you're wrong," rejoined Mike; "the mortar's what kapes them apart!"—Philadelphia Inquirer.

* * *

It isn't enough to pay as you go. You ought to save enough to pay your way back.—Pittsburg Gazette.

Waterproofing in Refrigerating Work

By EDWARD W. DE KNIGHT, New York.*

WATERPROOFING means more to refrigerating engineering than to any other branch of engineering work. To the refrigerating engineer it means not only the safety and security of a building foundation, but the perfection of that which is the very corner stone of successful refrigeration —insulation.

What is perfect insulation, is still a debatable question. We know this, however, that no insulation is perfect which is not waterproof and dry. Moist or wet insulation is not only valuless, but destructive of the very purpose for which it was devised.

Insulating means waterproofing. Waterproofness means insulation. The two are correlative; they must go together—no matter in what light and for what purpose they may be considered. The asbestos lagging, for instance, enveloping and insulating a locomotive boiler, to retain heat, would be worthless if it were not waterproofed by the steel plates covering the lagging. The principle works the same, whether in retaining heat or in retaining cold. In the past the refrigerating engineer seems to have been amply satisfied with lining air spaces, whether filled or not—with one of the many insulating materials on the market—with not even an impervious felt, but ordinary thin, waterproofed paper, carelessly tacked in place. But advanced refrigeration needs more efficient and more scientific treatment.

Waterproofing applies to every part of cold storage construction—to the foundation of the building, to the walls above grade, to the roof, to the various floors, to the partitions separating the different compartments, to the ceilings, etc.

For Foundations.

The modern and correct theory in waterproofing a building foundation is to insulate it away from and out of contact with the earth. This is accomplished by applying to the exterior surface of the foundation a tough, elastic, absolutely impervious membrane or stratum, so that not only moisture, but electrolysis can not come in contact with and affect the walls.

It is absolutely impossible to accomplish this by coating the exterior surface of the walls with washes or cement plaster, which will eventually crack; still less by applying a layer of cement plaster on the interior surface of the walls. This neither insulates nor waterproofs the wall, but allows its saturation clear through, with the consequent destructive action by not only moisture, but that vital enemy to the embedded steel—electrolysis.

We have now reached that point where we must differentiate as between the integral or rigid system of waterproofing and the elastic or membrane method, and select that one which satisfies our judgment.

All efforts in the waterproofing of structural work are divided into two main, totally divergent, lines; i. e.:

First—Treating concrete to make it, in itself, impermeable. This may be termed the integral or rigid method.

Second—Protecting concrete or masonry with something apart therefrom, to waterproof and insulate it. This we term the elastic or "membrane method."

To sum it up, the vital question is: Shall water reach the concrete, or shall it not reach the concrete? The real point at issue, therefore, is one of method, which must be first settled before we can intelligently discuss the question of materials. In determining the method, as between the

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elastic and the rigid system, the production and selection of the proper materials will settle itself. We will consider the two above-described systems separately.

To Make Concrete Impermeable—The Rigid Method.

Treating concrete to make it, in itself, impermeable rests upon two methods:

First—Mixing certain chemicals with the concrete to make the concrete, in itself, impermeable.

Second—Applying a cement plaster, or wash, on the concrete to harden its surface.

The ingredients generally used are lime, silicate of soda, lye, soap, alum, etc.

One of the present chief difficulties in concrete work is to obtain concrete properly mixed in the field. This difficulty, instead of being lessened, will be greatly augumented by the mixing of chemicals with the cement with the idea of making the concrete watertight. Certainly, to obtain a concrete so perfect as to be perfectly watertight will be a much more difficult thing than to obtain ordinarily sound concrete. In either case, whether with or without the incorporation of the hardening chemicals, there will always exist zones weak in quality and density. There is also the added danger of the uncertain effect the addition of the chemicals will, in time, have upon the tenacity and the durability of the concrete itself, and especially upon the embedded steel. This is all experimental, and not tried and tested, waterproofing.

There is a fine distinction between testing concrete for strength and testing it for watertightness. The difficulty is that these two principles are confounded by those who seek to make concrete in itself watertight.

Assume, for the moment, that concrete per se may be made impermeable. If this impermeability will not prevent cracking, and as cracking will destroy the value of impermeability, why attempt to make concrete impermeable? Granted that even limited impermeability, as it were, is a desirable quality, is there not needed, however, something additional for dependable and perfect waterproofness for general conditions and practical work?

Laboratory Tests Not Sufficient.

Waterproofness is not what it is today, but years hence. Because a briquette, or cube, or box of specially-treated concrete remains watertight in or out of a laboratory for one or twelve months is no warranty that concrete can be made permanently watertight for practical purposes. Assuming even that there can be had concrete in monolithic form so perfect in texture and mixture as the specially prepared laboratory sample, masses of concrete in the open are subject to conditions, especially in this latitude, impossible of ascertainment and test in a laboratory sample: to extremes of heat and cold, to settlement, to contraction and expansion, to earth tremors, both natural and artificial—resulting in fractures, the opening of pores, etc., a process which certainly does not decrease with the advance of years. Water will come through concrete in time. It will take longer to work through so-called watertight concrete, but it will eventually come through it. Otherwise it would be contrary to the law of physics and nature. The same principle applies in greater course to cement plaster and hardening compounds for the surface.

We have seen water drawn up, through capillarity, 15 or 20 feet by concrete. We have also seen water percolate through concrete over 20 feet

thick. It may take two or three years to do so; meanwhile, the assumption is that the concrete is fairly watertight. When the concrete thus becomes damp, wet and saturated, it is almost impossible to eradicate the moisture. If the moisture freezes, expanding one-tenth its volume in so doing, it requires no stretch of imagination to calculate the effect upon the concrete or masonry. Enough water will be taken in through a crack before the crack is filled to attack and injure the steel.

Again, many engineers believe that by increasing the steel reinforcement the cracking of concrete will be prevented and the concrete also be made watertight. We may agree that it strengthens the concrete, but we can not agree that it makes it impervious. We know that steel, imbedded in cement and kept dry, will indefinitely retain its purity and strength. We know also that moisture, reaching the steel, creates corrosion. The immediate effect is to destroy the bond between the steel and the concrete. The heat and expanding gas from decomposition (which is progressive) press the cement away from the steel. There then no longer exists, in fact, steel-reinforced concrete, but the very opposite, and a menace to life and property, which may eventually end in a collapse. If there is a particle of iron in the plaster on the ceiling and wall of this room, it will make itself apparent by a brownish, raised spot or scale as the result of moisture in the air attracted by and decomposing the iron.

Cement Application to the Surface of Concrete.

The objection to the second method, i. e., applying a cement plaster or wash to the surface of the concrete, are too numerous to mention here. It is poor judgment to depend upon but one layer of any single thing, which in this case is an inelastic cement plaster or a thin, almost imperceptible, wash, as the sole waterproof protection of any structure. This is aside from any consideration of the splitting or cracking of the cement plaster. One infinitesimal pore imperfectly closed, by permitting the entrance of water, which would soon spread, would make valueless the balance of the washed surface.

Strange as it may sound, however, the advocates of the cement plaster method, while admitting the cracking of the cement from settlement, contraction, expansion, etc., now recommend that it be applied to the interior surfaces of the foundation walls, for the reason that there the cracks can be seen and plastered as they occur. This seems like transferring a bad thing to a worse position.

In the first place, waterproofing must not crack; if elastic, it will not crack.

In the second place, it is against the laws of nature and physics to place any kind of waterproofing in front (where in time it can be shoved or washed off) of the line of resistance (the wall proper), instead of behind it. To say that the material is so good and tenacious it will not be shoved off does not alter the fact that it is contrary to the laws of physics, and no amount of argument can make it right. Being based on a wrong theory, the result must be wrong eventually. It simply requires the right conjunction of events or conditions to demonstrate the truth, though it may be long delayed.

Most seriously, however, placing any waterproofing material, cement plaster or any other so-called waterproofing material on the interior surface of a foundation wall, overlooks the very purpose and real theory of waterproofing, which is to keep water out of the wall. Why permit the entire saturation of the wall through and through? No one can better realize what

this means than a refrigerating engineer. In the great majority of cases, foundations of buildings are waterproofed, not so much because of water pressure, but to prevent moisture entering the wall, working up the wall by capillarity and destroying the steel through corrosion and electroysis. In any case of considerable water pressure it requires no stretch of imagination to understand what would happen with a cracked waterproofing on the interior surface of a wall. Apply such practice to your own habitation. Would you desire the walls of your own home to be damp, wet and saturated clear through, impossible to heat and a menace to comfort and health? Would it not seem like criminal carelessness to allow such a condition solely because you placed a waterproofing on the interior surface of the wall so you could see it, when you could as readily, by the exercise of some forethought, have placed the waterproofing on the exterior and proper side of the wall, so as to make it, clear through and up, dry, warm and sanitary? If the principle be right in your own case it will be right in any other. To say that waterproofing is visible and patchable appeals to one and sounds well, but is misleading. Suppose it cracks under the boilers?

The great trouble is that the average engineer and architect has no time to study these important specialties, being engaged in the general proposition. He is apt, therefore, to be misled by good talking points. It is because of this and no other reason that a wrong principle is followed by the best of men. The following of it by such men for a time gives coinage to the principle and its circulation among others. In the course of time, however, it must, of its own self, eventually fail.

Another thing, concrete is not an insulator and is not proof against electrolysis. We have come to that development in our construction work, therefore, where we must consider that the real importance of waterproofing is not simply in keeping water out of buildings but in protecting and preserving the embedded steel. This vital fact is entirely overlooked by any method of waterproofing which would place the waterproofing on the interior surface of a foundation wall. Not only will no interior coating of cement, or any other waterproofing material, protect the steel, but no so-called "watertight" concrete, cement plaster or washes applied to even the exterior surface of the wall—even assuming that they did not crack and separate—would serve, because they do not and can not insulate. Waterproofing means insulation, as we stated in the beginning of this paper, and the application and importance of that fact is becoming more and more to be understood and appreciated by the thoughtful engineer and architect. Insulation means to separate, to get away from. There can be no waterproofing without insulation. It is a natural law. Therefore, any method of waterproofing not based on this principle is erroneous.

After due consideration, therefore, and recognizing the fact that so-called "watertight concrete" or cement plaster or washes are not in themselves insulators, does it not seem necessary and logical that we seek some other method of waterproofing than to rely upon watertightness in the concrete itself; that we get away from the concrete and provide something between the concrete and moisture, i. e., between the concrete and the insulating material and between the concrete and the earth, to so protect and insulate it that water will not reach the concrete, whether it cracks or not? This brings us to the consideration of the second method.

The Elastic or Membrane Method.

Under this head come the materials and methods for preventing water from coming in contact with the concrete. Practically the first efforts in

this direction were to coat the surface to be waterproofed with hot coal-tar pitch or asphalt, which, however, when set and cold, cracked and separated with any settling or cracking of the masonry. Burlap was subsequently used to reinforce the pitch or asphalt, without, however, preventing them from cracking, and the burlap, being of itself not waterproof, did not give waterproofness. Later on there came into use for this purpose tar paper, which, however, lacks pliability and tensile strength. Tar and tar paper have been extensively used for waterproofing in the past, simply because there was nothing else open to the profession. It was not until recent years that any serious effort was made to place waterproofing on a scientific basis and to make materials specially adapted to the various conditions, materials which would not become brittle like tar and tar paper, or be injuriously acted upon by water, the salts in the earth, alkali in cement, etc. The result of this specialization has been to greatly improve materials and methods, and to open to the profession products for difficult work and special conditions considerably in advance of old-school materials.

There are also used for waterproofing mastics composed of coal-tar pitch, or asphalt, mixed with sand or torpedo gravel, resembling somewhat, when finished, an asphalt pavement. Mastics on floors, especially where there is considerable vibration, soon separate from walls, steel columns and girders. If the mastic is made soft enough so as not to crack in winter, it becomes too soft to bear the load of traffic in summer. The chief objection to mastics is that they crack clear through with any contraction and expansion or cracking of the masonry or concrete surface of which they become an integral part when applied hot thereon.

Specifications also frequently require that the interior surfaces of foundation walls and floors shall be given one or two coats of some waterproofing paint. The paints might be excellent materials in themselves, but their use for such a purpose is a sheer waste of time and money, as they can not possibly prevent, for a number of obvious reasons, the percolation of water through the wall, or protect the embedded steel.

Textile Waterproofing Materials.

There are also now on the market a number of what are termed "textile" waterproofing materials, which, on examination, will be found composed, in many instances, of simply burlap, i. e., ordinary commercial bagging. The fibre is vegetable, is extracted from the bark of trees, and is very perishable, especially in underground conditions. The apparent strength of such materials misleads one into using them, whereas strength alone is not by any means, the first essential in a waterproofing material. These saturated textiles, burlaps or baggings are, in a measure, going backward to the old-school method of incorporating burlap with pitch or asphalt to reinforce it as steel reinforces concrete. There is a clear distinction, however, between the principle and results to be obtained in reinforcing concrete with steel and reinforcing waterproofing with burlaped textiles. The two should not be confounded. Otherwise it would be advisable to reinforce the bitumen with copper mesh. The treated or saturated burlap is no more waterproof, especially for water-pressure work, than when originally used to hold pitch or asphalt on a wall. This can be easily tested by placing a single sheet or thickness of the treated burlap under the slightest water pressure (as under a spigot), when it will be found that water easily passes through the interstices of the material. A woven fabric

has never proved superior for waterproofing, even though it be canvas, because the fibres pull against instead of with each other, resulting in the opening of the interstices and the usual splitting of the fabric.

The best material is unquestionably a strong, fibrous felt, made in itself, i. e., in one sheet, absolutely impervious to air and water by a process of saturation and then coating with materials specially adapted to withstand the injurious action of water, and particularly all underground conditions. It is then practically an impervious membrane or skin through which, in one sheet, water will not pass. As many layers thereof as the conditions require can be then cemented together with a waterproof bitumen cement, not too weak or hard and brittle for the felt, but as strong and elastic as the felt. This forms a waterproof stratum so strong, tough and pliable that, without injury, it can be readily pulled, bent, turned, twisted, etc. Whether in a building foundation, covering the floor of a bridge or enveloping a tunnel, it readily conforms to the final conformation of the surface waterproofed, from which it is practically apart and which it insulates and protects under all conditions, settlements, jars, shocks, cracks, expansion, contraction, heat, snow, ice, water, etc.

The speaker some time ago termed this "the membrane method," and firmly believes it the basis for the development of a perfect waterproofing. It is not, therefore, primarily a question of material, but of method.

Reasons For The Name.

We call it the "membrane method" because of the teaching of natural law. There is nothing made by man that its prototype in some form is not somewhere in nature. No man ever invented a color. No man ever devised an insulation for the most intricate electrical machinery as perfect as the insulation of the human brain—the dynamo of the universe. In seeking a guide, therefore, in our present problem, we find throughout nature no waterproofing which is hard or vitreous or rigid, because nature waterproofs only living things (things that move), not dead ones or inorganic ones, which do not require it, but, by moisture, heat and decomposition are resolved back into carbonate of lime. Therefore, all things that live and move require, and are by necessity protected with, a flexible, elastic skin, yielding to growth, movement, action. Therein lies the origin, the first principle of waterproofing, natural or artificial. Can any other principle be right?

In the very beginning of germination nature begins to cover, insulate and protect, with an elastic film, skin or membrane, the life germ. This law prevails through the whole line of plant and animal life, from a grain of mustard up to a mastodon. Puncture this protecting skin or membrane and there immediately ensues decomposition (or corrosion) in the exposed flesh. So long as the plant or animal lives, whether one or a hundred years, this yielding membrane perfectly protects. We ourselves take the tough hide and the fine elastic skin of animals to protect our feet and waterproof our hands, both our own and the artificial protection readily yielding to every move of the foot or hand.

If a chicken came forth in a coating of soap and alum or cement plaster, its usefulness would end with its appearance. Nor do we waterproof our feet or our hands by immersing them in a bath of cement, which would make them set, rigid and useless. Yet, is this not essentially what we do when we would protect and waterproof our walls and structures, which must settle, contract, expand and move, with a coating of cement plaster or an injection of hardening fluid to embalm them, thus thwarting natural law and preventing instead of providing for the natural functions of the masonry or concrete, and also imperiling both the waterproofness and the usefulness of the structure? Obviously, therefore, a natural waterproofing is one which—skin, hide or membranelike—yields to the natural contraction and expansion of the structure and protects it by preventing water from reaching it. If, therefore, the skin or membrane theory is logical, natural and right, it then simply remains for the chemist and the manufacturer to scientifically perfect materials necessary for the practical application of that method.

Coming down to actual work under this method, we would submit the following:

Recommendations for Practice.

1.—Properly design the thing to be waterproofed. Use no set specification. Each condition has its characteristics and should be carefully considered, especially with reference to the character and use of the structure.

2.—Select the best "materials" obtainable for the desired purpose.

3.—See to the correct application of the materials. In water-pressure work, as in foundations, employ only skilled labor, thoroughly experienced in such work.

Foundations.—The walls should be waterproofed and insulated on the exterior, specially prepared, surface with a thick, tough, elastic stratum of waterproofing composed of alternate layers of impervious felt and bitumen. Use as many layers of felt as the conditions require, according to the water pressures, etc., in any event, use not fewer than two layers of felt. Carry the stratum under the foundation floor. Thus insulate and waterproof the foundation, forming practically a waterproof box in which the foundation proper is set.

It pays to protect the waterproofing stratum on the walls with a layer of cement mortar or a course of brick.

Walls Above Grade.—In the perfect cold storage structure there can be well afforded above grade an outer or curtain wall and an inner or wall proper. Line the interior surface of the curtain wall, or if no curtain wall be used, the interior surface of the wall proper, with one layer (two would be better) of impervious felt cemented to the wall, thus forming thereon a membrane through which air and moisture cannot pass.

Similarly treat all subdivisions of the wall which may be divided into air spaces, whether or not they be filled with an insulating material. This forms on both sides of the insulating medium an impervious air-tight membrane, which not only perfects the air space, but preserves the efficiency of the insulating material by protecting it against the entrance of air and moisture.

Also similarly treat the floors, ceilings and partitions of each compartment. When the compartments are of wood, lap the felt sheets three inches, cement the laps only and tack same.

Floors.—Under and over each layer of insulating material apply one sheet of impervious felt, lapped three inches and the lap tightly cemented.

If the wearing or walking surface of the floors be of mastic or of concrete, apply under same three layers (though two would serve) of impervious felt, thoroughly cemented together with special hot bitumen, so as to form a strong, pliable, waterproof stratum under the wearing surface. This will effectually stop any moisture and water from condensation or other cause working its way down through cracks in the cement wearing surface and destroying the usefulness of the material.



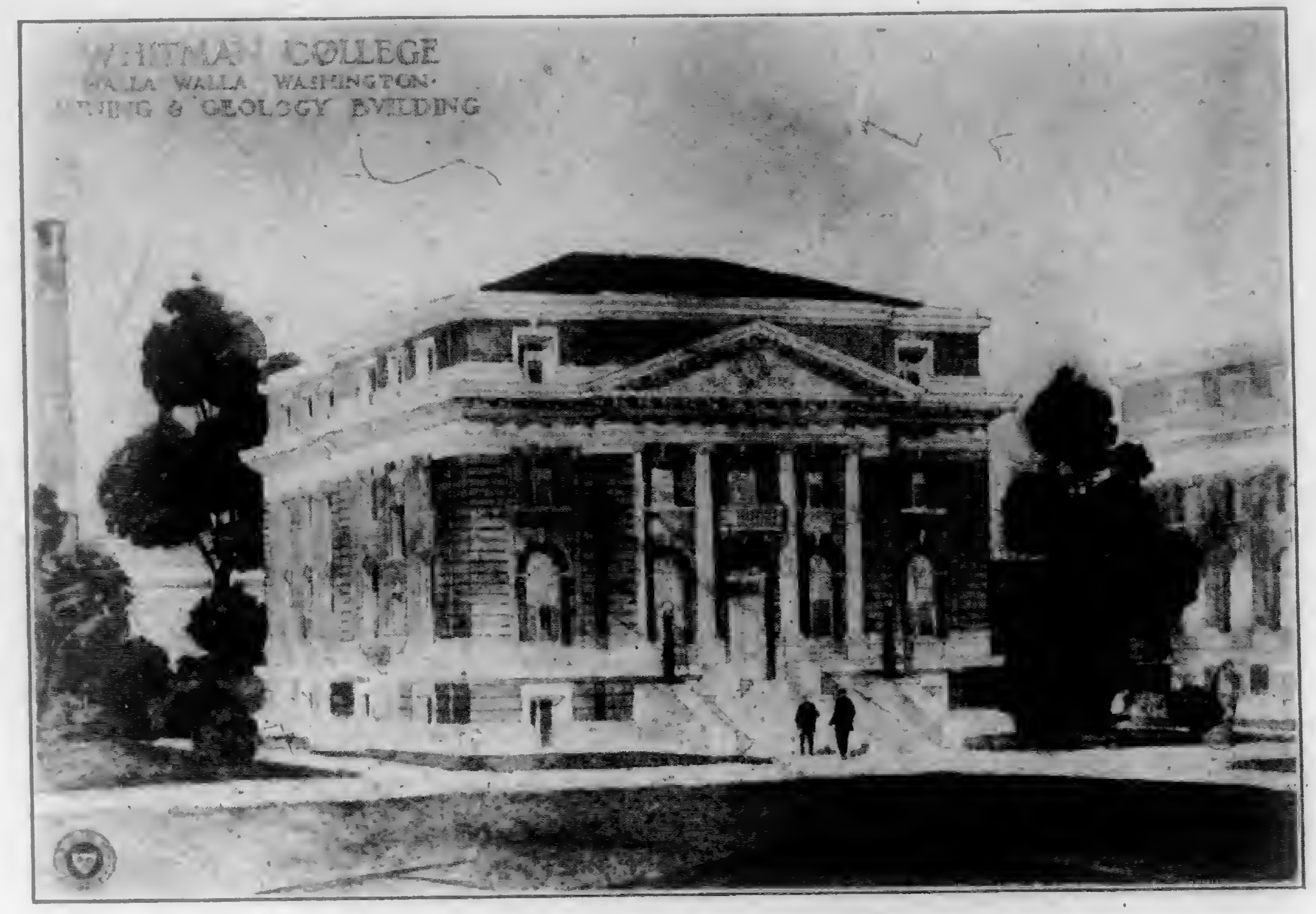
Model of Design for a Bank Building
Sidney B. Newsom, Architect

Cracks, in greater or less degree, eventually develop in all cement or mastic (asphalt) wearing surfaces, especially under refrigeration conditions. It will be admitted that it is not only the large quantity of water which settles on or flows over a floor and by exaporation or drainage disappears, with which the refrigerating engineer is most concerned, but the small quantity of moisture or water which through even the smallest crack works its way through into the insulation and immediately turns it from a medium of value into one of absolute destruction. These small, apparently harmless cracks—more often unseen than seen—are like the small worm which sinks the ship. Against these cracks and defects the "membrane method" at all times, whether the temperature be up or the temperature be down, affords a perfect protection to the underlying insulation. It is absolutely impossible to obtain such protection by any coating, or wash, or layer of cement plaster, applied to the surface of the concrete floor.

Roof.— Cover the roof with three or four layers of impervious felt cemented together with hot bitumen. Cover this waterproof stratum with a course of brick laid flat or a thin layer of cement, over which place good soil six inches deep. Then sow same with grass seed. This will provide a cool, insulating roof which cannot be excelled for cold storage buildings. At the same time it utilizes valuable roof space which now goes to waste.

Finally.—In refrigerating construction we must, above all else, and again reiterate—keep moisture out of the insulation—in other words, "keep our powder dry."

The theory of insulation and waterproofness must be so studied and perfected by the refrigerating engineer as to properly include the entire structure—foundation, roof, walls, interiors—and not until then will his work be crowned with success.



Mining and Geology Building, Whitman College, Portland, Ore.
MacNaughton, Raymond & Lawrence, Architects and Engineers

The Architecture of the New Whitman College

By E. F. LAWRENCE, Architect.*

WHITMAN College is one of the few western colleges rivaling the eastern institutions in a rich tradition. It has set a high standard of scholarship as is shown by its ranking in the Carnegie foundation and by the fact that its graduates receive full value for their degrees in the colleges of the highest standing throughout the country.

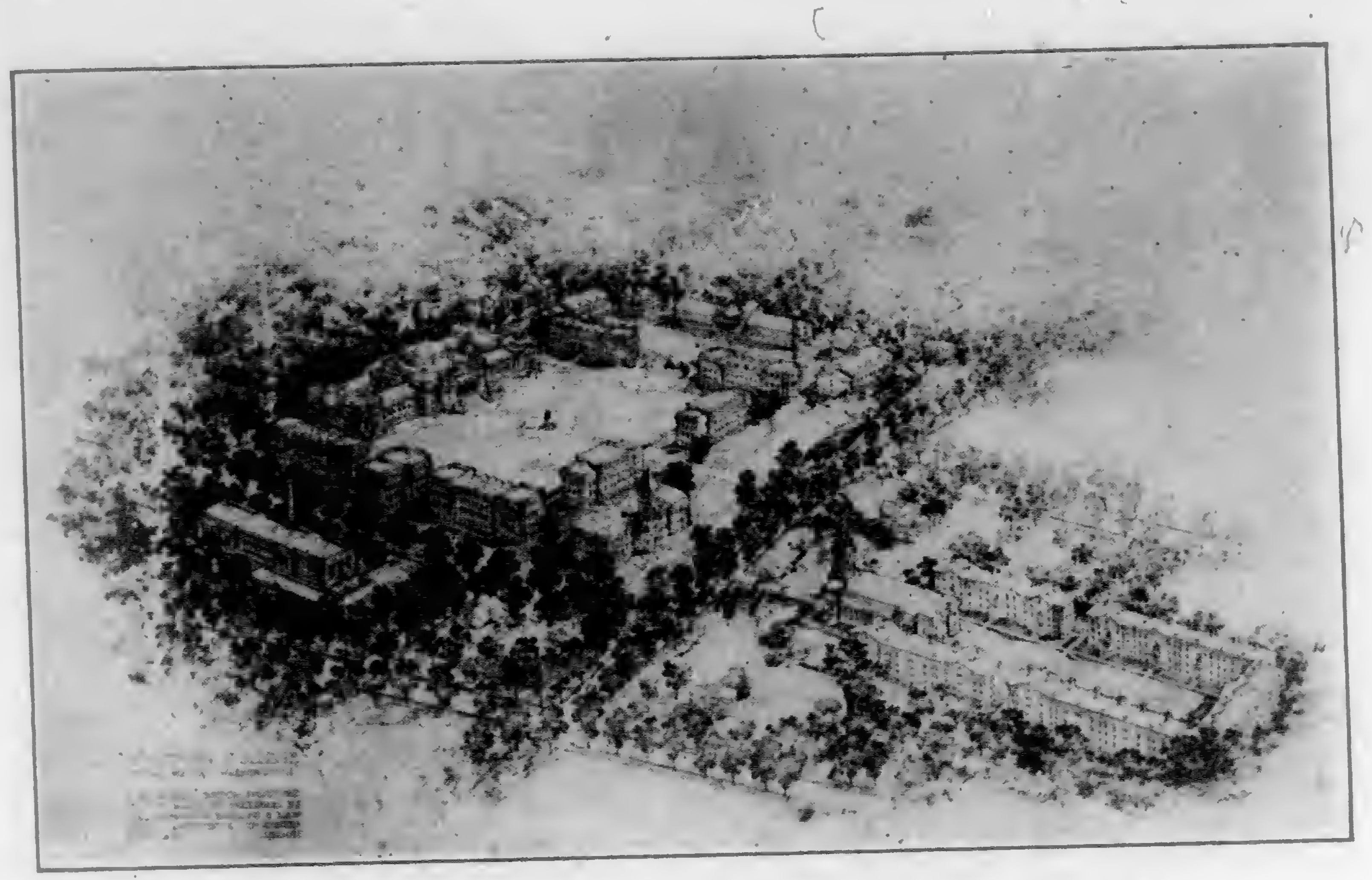
The Board of Overseers of The New Whitman, realizing the vast engineering opportunities in the undeveloped Northwest, are preparing for a future technological school of considerable importance, and have wisely seen that architectural harmony may be obtained only by working toward a definite plan.

In this capacity the architects have worked upon the problem and submitted to the Board of Overseers at the Educational Congress held at Walla Walla, on November 17th and 18th, a proposed treatment of the grounds now owned by the College. A simple architectural treatment has been adopted throughout the entire group, the style being somewhat colonial. The crowning feature of the composition in the large quadrangle is the auditorium, library and museum combined into one large building, which is the most monumental building of the entire group. This building is flanked to the east by the fine arts, architectural and archaeology building and the academic building, while to the west is the main engineering group with civil and mechanical engineering, mining and geology building and biology and sanitation, forestry and irrigation buildings. Back of these buildings abutting the railroad track is the power group and shops with steam and electrical laboratories. Opposite the auditorium and to the south are the electrical engineering

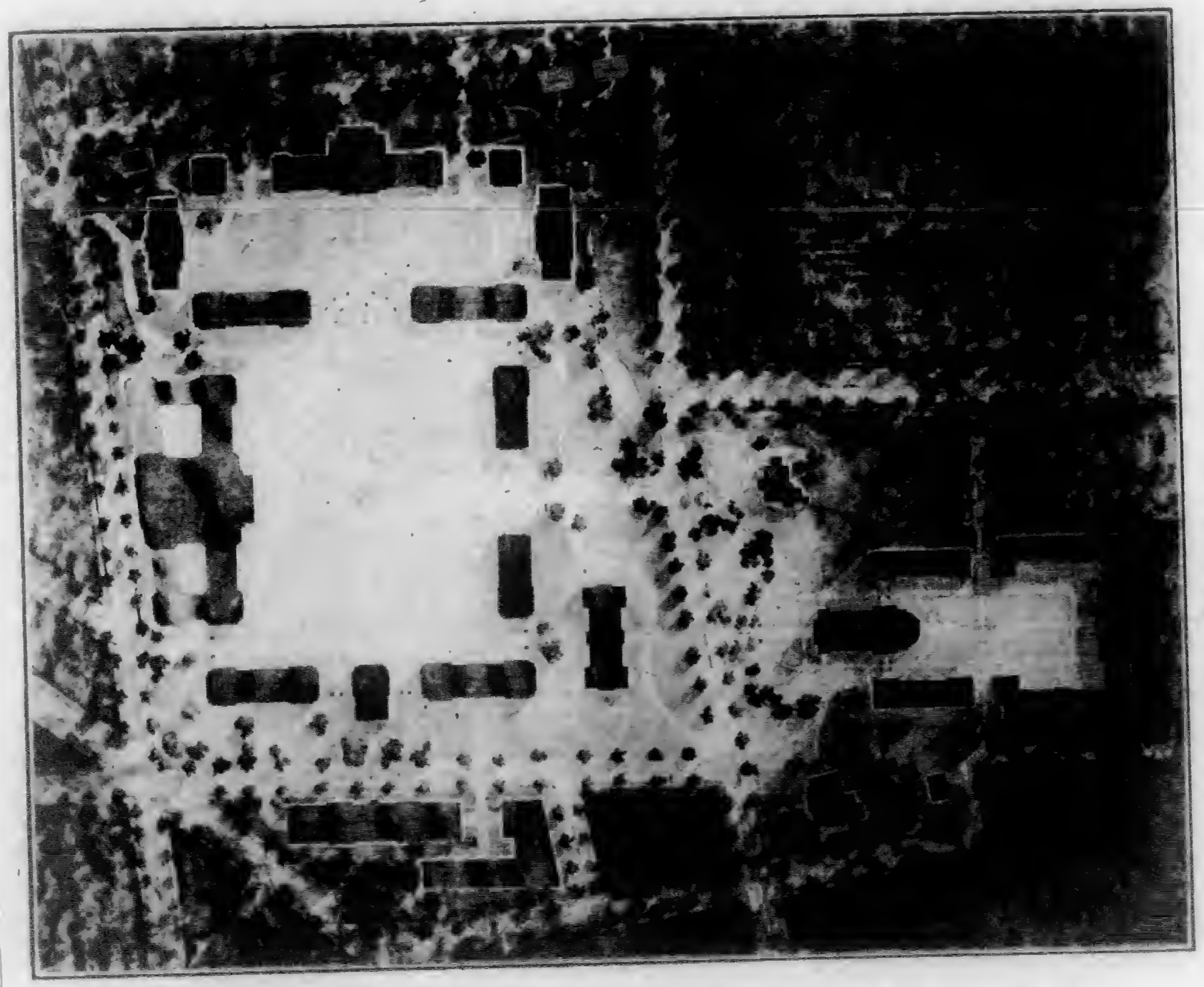
* Mr. Lawrence is a member of the firm of MacNaughton, Raymond & Lawrence, Architects and Engineers, Portland, Ore.



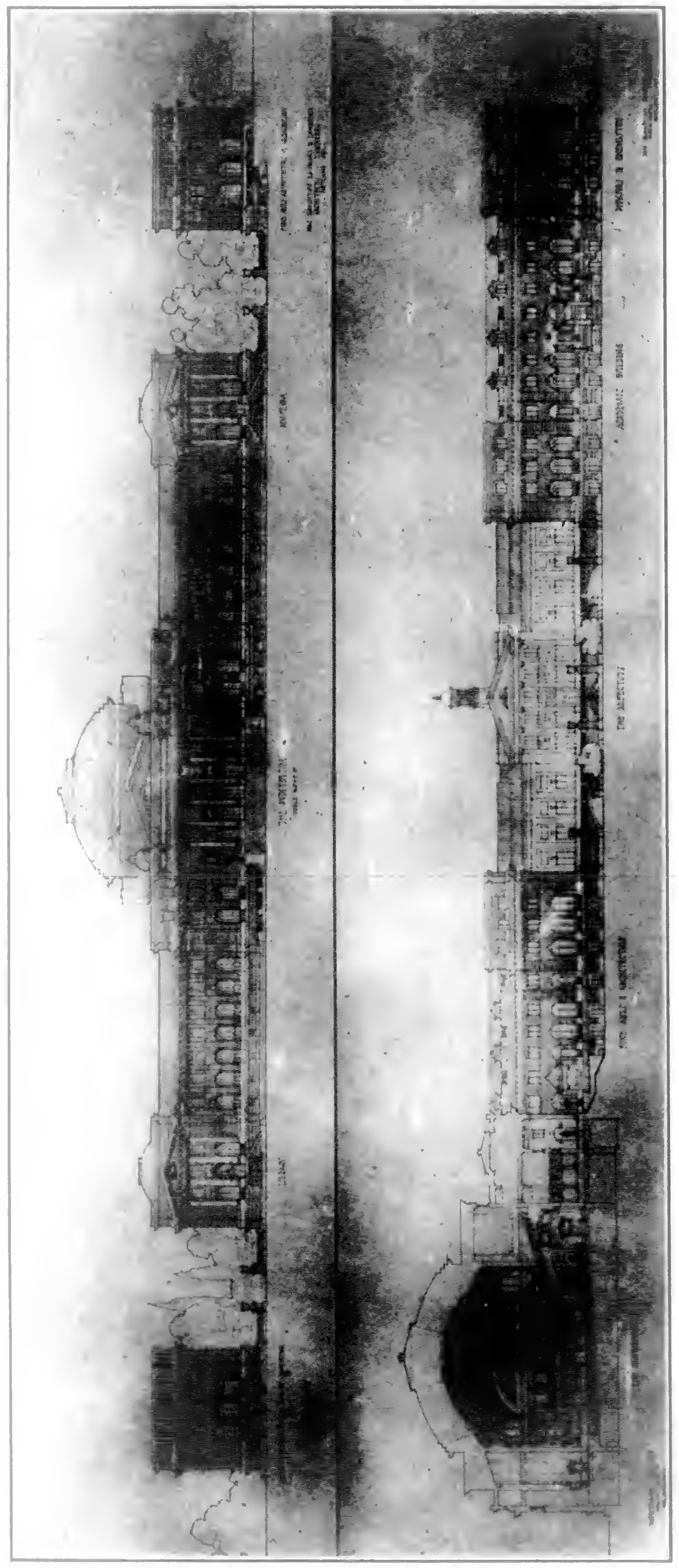
Buildings for Whitman College, Walla Walla, Wash.
MacNaughton, Raymond & Lawrence, Architects and Engineers



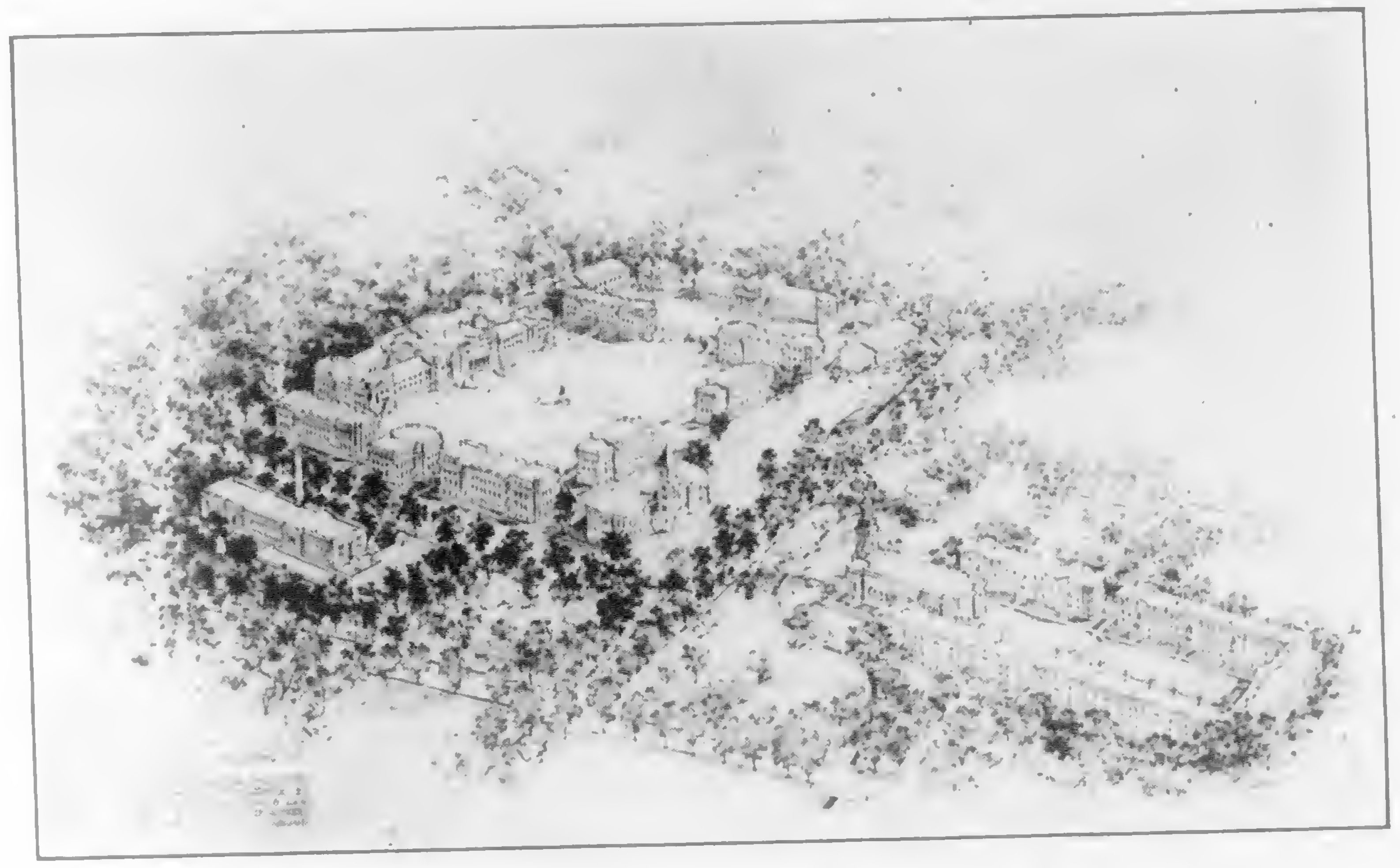
Bird's-eye View of Whitman College Buildings, Walla Walla, Wash.



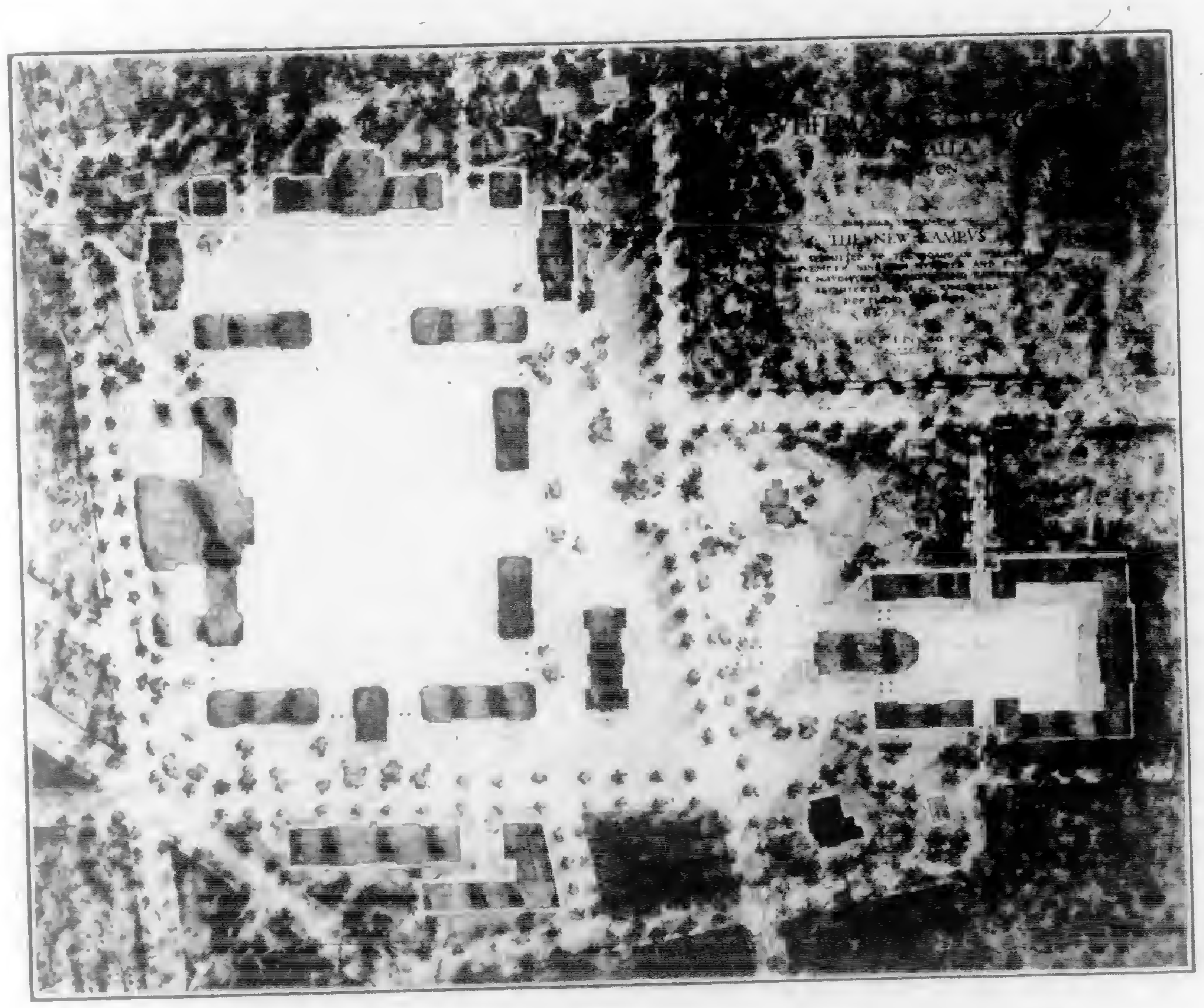
Proposed Treatment of the new Campus, Whitman College, Walla Walla, Wash.
MacNaughton, Raymond & Lawrence, Architects and Engineers



Buildings for Whitman College, Walla Walla, Wash.
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Bird's-eye View of Whitman College Buildings, Walla Walla, Wash.



Proposed Treatment of the new Campus, Whitman College, Walla Walla, Wash.
MacNaughton, Raymond & Lawrence, Architects and Engineers



Civil and Mechanical Engineering Building, Whitman College, Walla Walla, Wash.
MacNaughton, Raymond & Lawrence, Architects and Engineers

and physics and chemistry buildings, while the present Whitman memorial building serving as an administrative building is centered on the pathway being the west boundry of the large quadrangle. A statue of Marcus Whitman, the murdered missionary is in the center of this quadrangle.

Raised slightly above this quadrangle lies the secondary campus, more informal in treatment, about which are the dining halls for both men and women, the gymnasiums for both sexes and the Christian Association buildings.

Across the street from the memorial building to the south is the college chapel, closing the quadrangle of the men's dormitories. The girls dormitory is to be to the north and east of the general campus as will be also the stadium and athletic field. Red brick will be used trimmed with buff terra cotta and a careful study of the planting problem has been made to make an appropriate setting for the architecture.

Active building operations will probably start in the spring or summer on the principal buildings of the engineering group as well as a portion of the dormitory quadrangle.

* * *

Inexpensive Andirons

If you will examine the andirons in fireplaces of most small apartments, fireplaces where nothing, or at best a gas-log, is to be burned, you will see an example of the cheapest kind of spun brass andiron. It is merely lengths of thin brass piping and lacquered brass balls strung together on invisible iron frames. A slight blow will dent the brass balls, and you have only to pick the things up to realize how flimsy they are.

Many thousands of home builders who have real fireplaces in which they burn wood furnish them with these cheap andirons.

There are plenty of good cast brass andirons made nowadays, but they cost three times as much as a pair of spun brass. You may buy the latter as low as $2.50 a pair. It is hard to get good modern cast brass andirons for less than $7 or $8 a pair, and they come as high as $100.

It is no longer easy to pick up old cast brass andirons at the junk shops, and the antique shops hold them at high prices. If you keep your eyes open when visiting the country you may still pick up good old andirons at $3 or $4 a pair, and they are usually quite as well made as the best of the modern cast brass.—The House Beautiful.

Scheme to Tunnel San Francisco Bay

By F. T. NEWBERY, C. E.

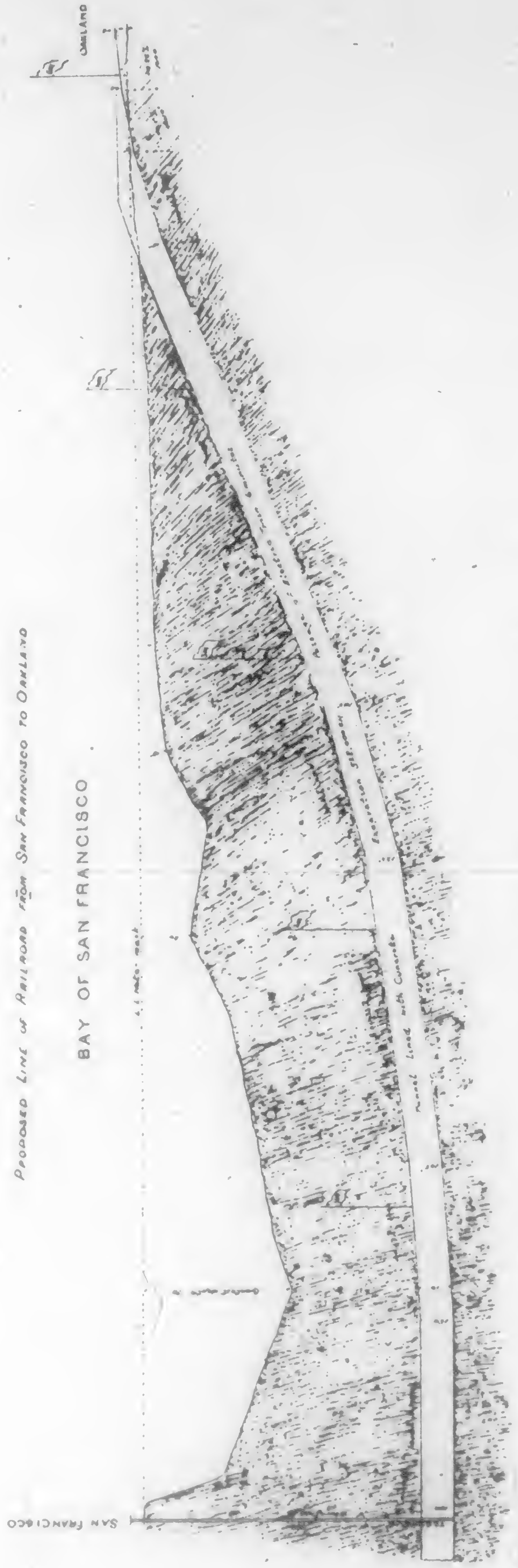
TO CONNECT the city of San Francisco with the cities of Oakland and Berkeley by means of a tunnel beneath the waters of the bay is an engineering feat that has many times been thought out but not always with entirely practical results. The writer would organize a great transportation company with a capital stock of $5,000,000 in 500,000 shares of $10 each.

According to the writer's plans the line commences on the surface of the streets of the City of Oakland, thence running westerly, enters the portal of a concrete lined tunnel and continues on an easy grade (maximum 1% for 1.7 miles) which gradually diminishes to level. At three miles from the Oakland shore line the top of the tunnel is 114 feet below the surface of the bay with only 24 feet depth of water. At the shore line of the city of San Francisco the top of the tunnel is 134 feet below the surface of the bay. This double track tunnel is made perfectly secure and water-tight with an ample thickness of concrete which may be expected to last forever. It is projected in a straight line; the two tracks of standard gauge (4′ 8½″) are separated by a row of pillars two feet square, arched from one pillar to the next, 15 feet between centers.

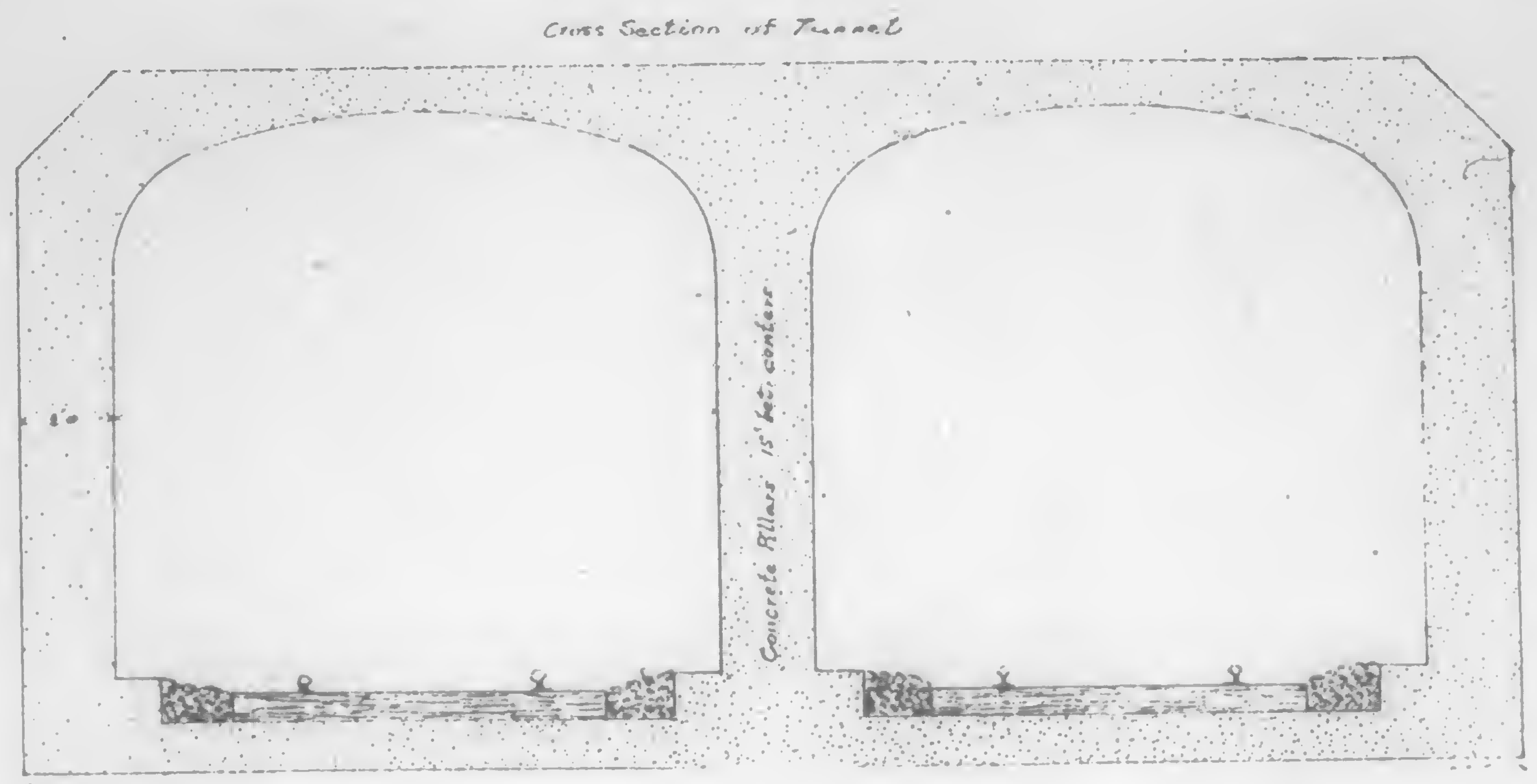
The excavation is 32 feet wide and 16 feet high; the length of the tunnel is five miles and the excavation is good material the whole distance. No right of way will be purchased except for terminal purposes. No connection will be made with any other railroad as all passengers will be charged a uniform 5 cent fare excepting commuters, and the time occupied in crossing in rain, shine, fog or storm will be six minutes with a train every three minutes. Persons willing to assist in this enterprise will be able to purchase books of commutation trip tickets at the rate $12 per year without date limits and transferable. Under these exceptionable conditions all lines of railroad on each side of the bay will be anxious to reach as near as possible the east or west terminus of the railroad. The line will be operated by electricity made by the company on their own premises. At the San Francisco terminus the passengers will be brought to the surface in fast running elevators. At night from 11 P. M. to 5 A. M. freight trains will be run at the same rate of speed, the tariff being fixed at about 50 cents per ton.

The specifications for the construction of this line of railroad will be as follows, reference being had to the accompanying profile and cross section.

Item		
Excavation, 528,000 cubic yards, at $2.00		$1,056,000
Cement, 200,000 barrels, at $2.00		400,000
Broken Stone, 132,000 cubic yards, at $2.00		264 000
Sand, 55,000 cubic yards, at $1.00		55,000
Labor		280,000
13,200 Ties (Sawn) 8″x6″x8′, at 80 cents		11,000
Rails, 90 lbs. per yard, 1,400 tons		70,000
Spikes, fish-plates, switches, etc.		5,000
Bonding rails, electric wiring, etc.		20,000
Elevators		20,000
Land, etc.		103.000
Engineering and contingencies		220,000
		$2,500,000
100 Passenger Cars (equipped with 2-100 H motors) at $2,500	$250.000	
100 Freight Cars, at $1,000	100,000	
1,000 H Steam Engine, Boilers and Electric Generators, Repair Shops	150,000	
Total cost		$3,000.000



Scheme to Tunnel San Francisco Bay



Dr.	
Issue 40 year bonds for $3,000,000, at 5%	$400 per diem
Sinking Fund	200 " "
	$600 " "
Cr.	
10,000 passengers each way, at 5c	$1,000 per diem
500 tons freight each way, at 50c	500 " "
	$1,500 " "

The operation and maintenance charges will be light as there is very little of a perishable nature about the plant. It is compact and easily handled. It is also entirely out of the reach of politics, and there will be very few accidents chargeable to the company. The company can remain in business any length of time.

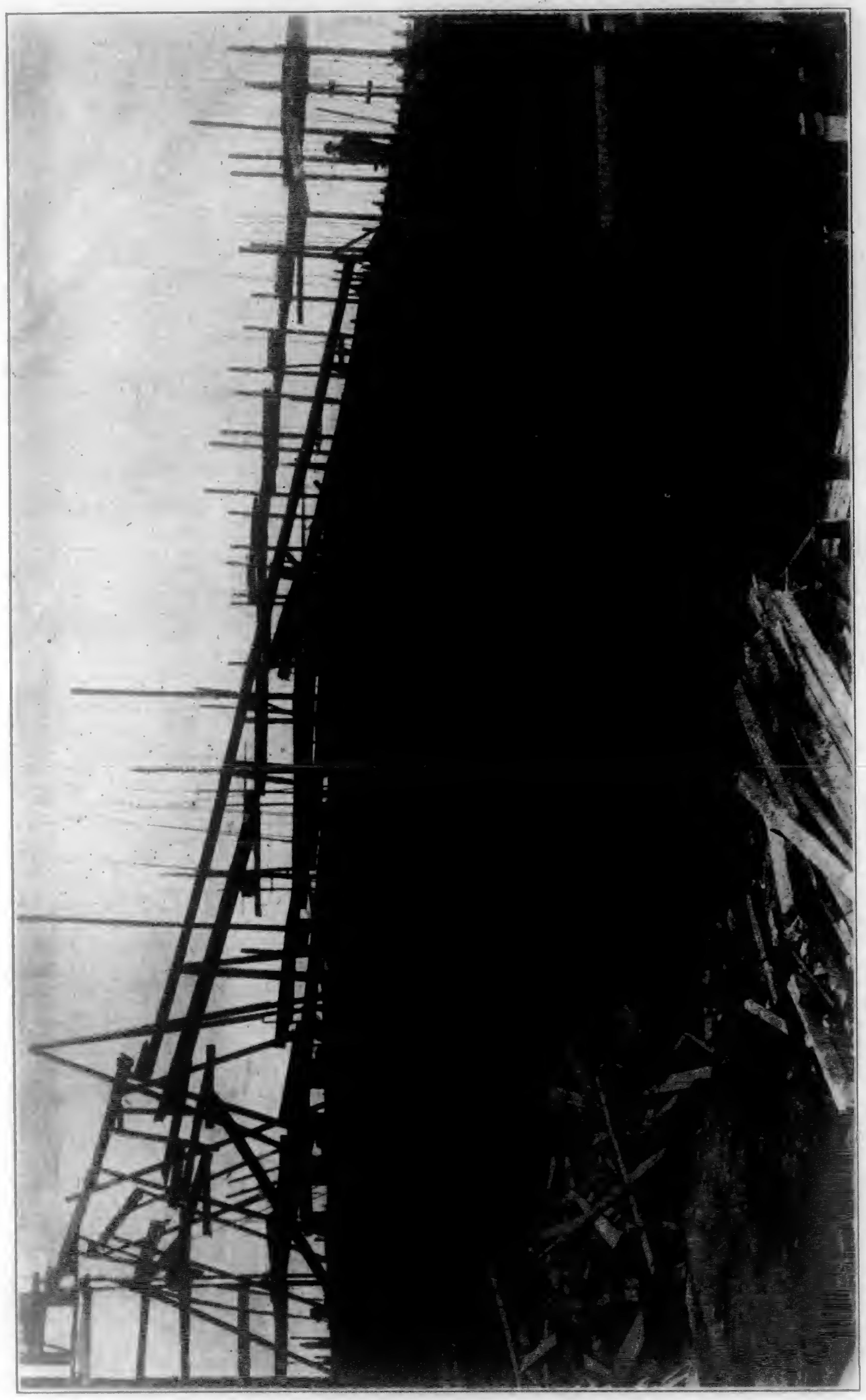
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The Rebuilding of the Cliff House

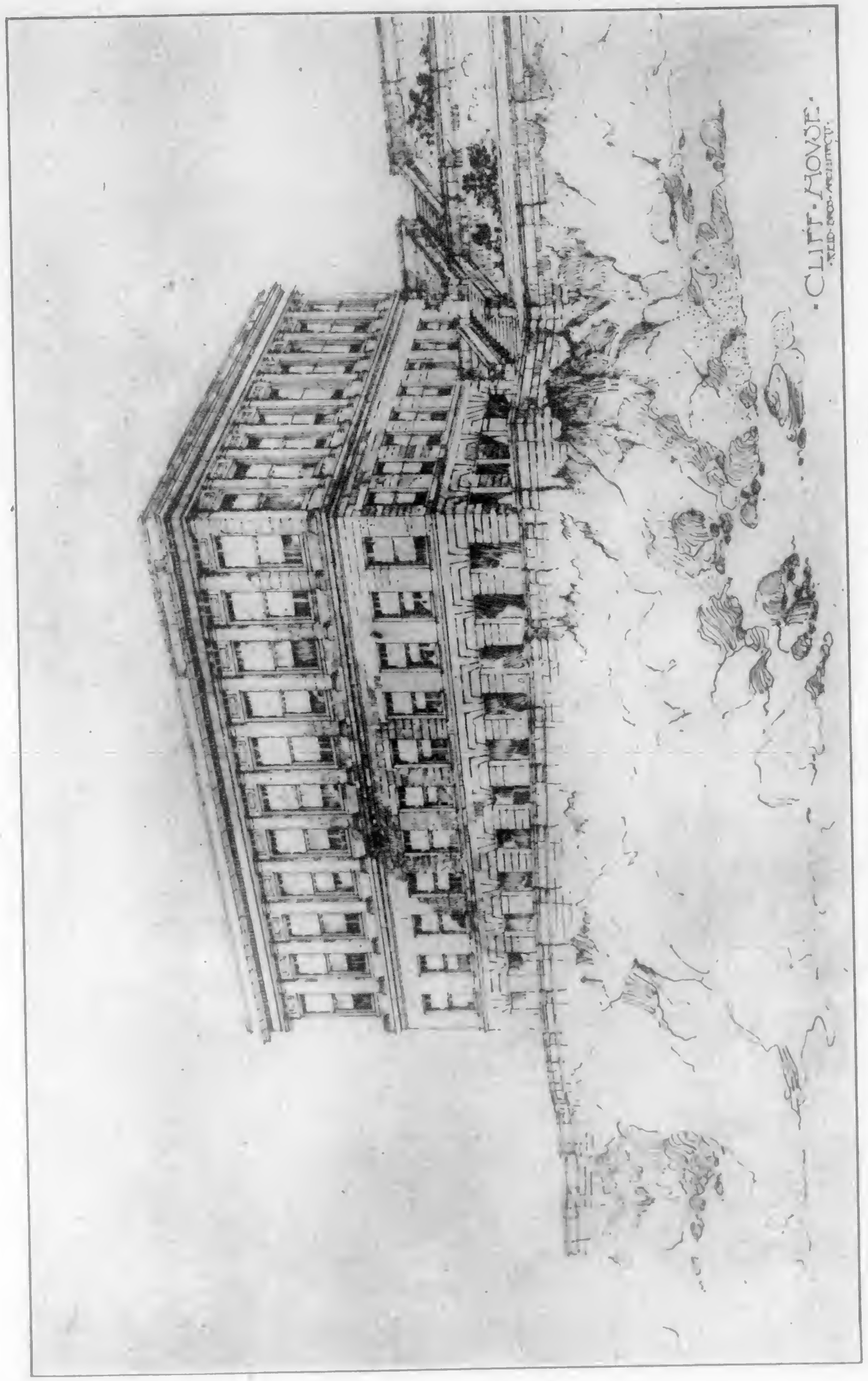
CONSIDERABLE interest is being taken in the construction of the Cliff House in San Francisco, to replace the famous old structure which was destroyed by fire. The new building in no way resembles the old one. The latter was built almost entirely of wood and once the flames got started the historic pile of timber burned like a Swedish match.

The architects, Messrs. Reid Bros. have treated the building as an engineering as well as an architectural problem and they have successfully combined the two, producing a structure that is in perfect harmony with the surroundings and at the same time substantial and fire proof.

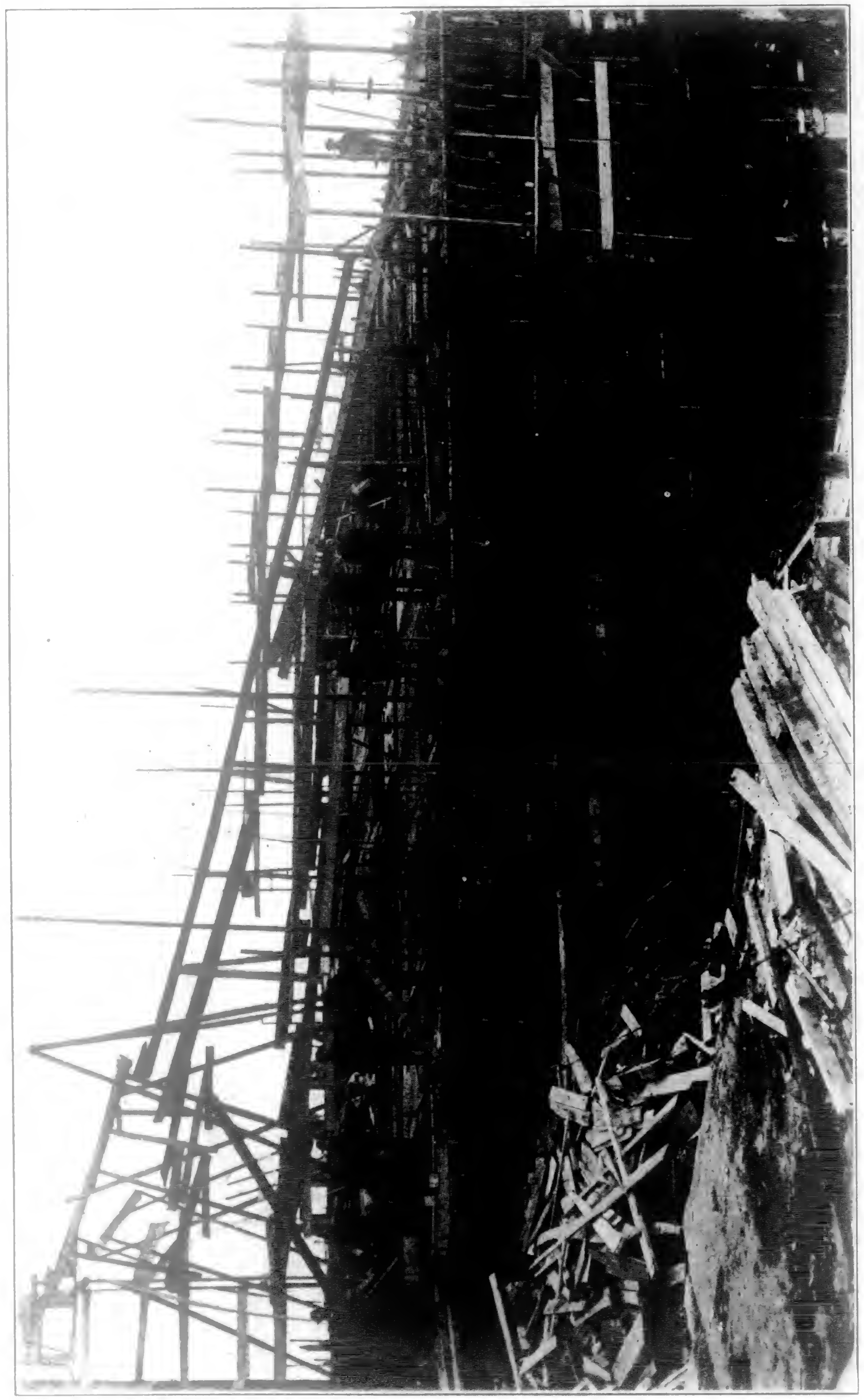
The building is to be entirely of reinforced concrete, with steel beam floors and roof, the whole being made monolithic in each story by the novel method introduced by Mr. A. W. Pattiani, manager of the San Francisco Rebuilding Company, the contractors of the building. By conveying all concrete by gravity, silently and without vibration to steel or forms, so that the moment of setting of the cement is not disturbed, a much stronger and more monolithic construction is obtained. Mr. Pattiani's method is unquestionably one of the best yet conceived for quick and economical handling of concrete and architects and engineers who have inspected the work are exceedingly well pleased with the results. A complete story is poured in three days time at a minimum cost. The accompanying illustrations show the plant in operation at the second floor slab and the building as it will appear when finished.



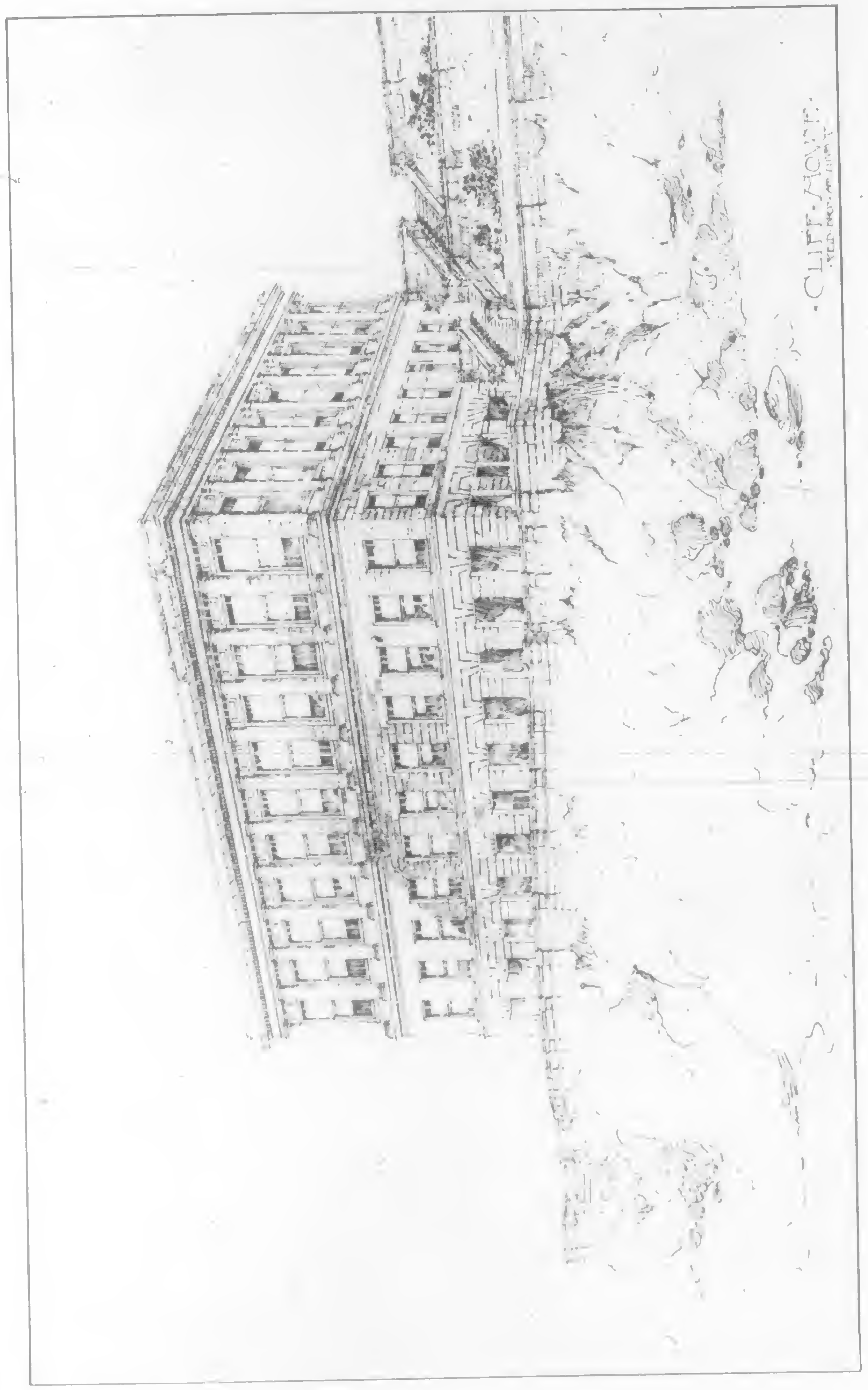
Rebuilding the Cliff House, San Francisco, Showing Plant of San Francisco Rebuilding Company in Operation at the Second Floor Slab.



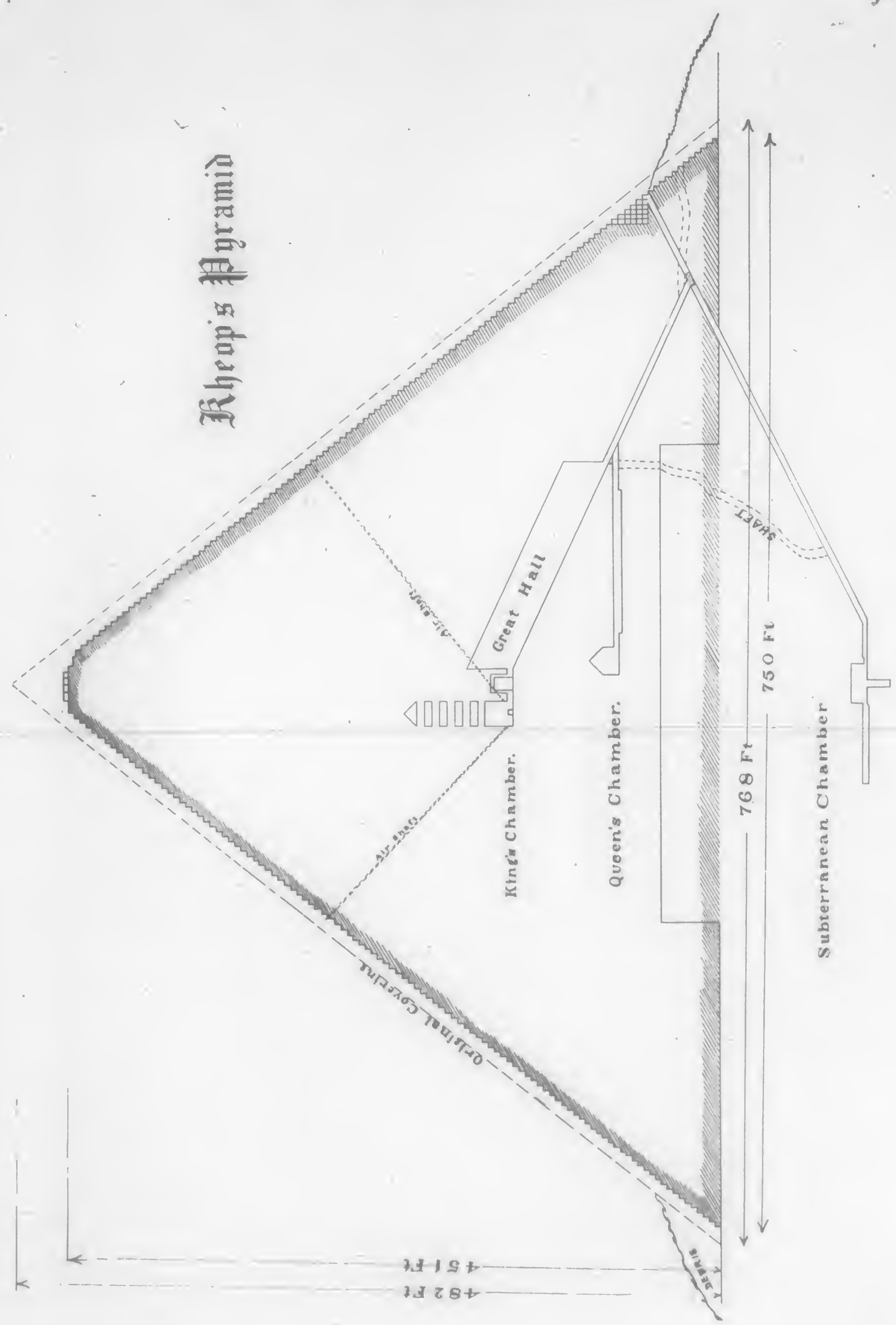
Perspective View of Cliff House, San Francisco. Reid Bros., Architects



Rebuilding the Cliff House, San Francisco, Showing Plant of San Francisco Rebuilding Company in Operation at the Second Floor Slab.



Perspective View of Cliff House, San Francisco. Reid Bros., Architects



The Great Pyramid of Gizeh

In Two Papers—I.

By JAMES DICKIE, M. E.

THE Architect and Engineer gives its readers in this issue the first of two papers describing in a most interesting manner the impressions of Mr. James Dickie while visiting the great Pyramid of Gizeh, more commonly known as the Kheop's Pyramid. The facts which Mr. Dickie gathered in his exploration of the pyramid cover a wide range of thought, and writing as he does from the position of the mechanical engineer, he brings out some amazing points not heretofore set forth by other writers. The problems of transporting the huge stones in those times, the kind of labor employed, and the real purpose of engaging in so stupendous an undertaking are all discussed at length, and the conclusions made are quite as logical as they are interesting.—Ed.

THE great pyramid of Gizeh, near Cairo, in Egypt, is well worth a visit from anyone, and according to the bent of the mind of the traveler will be his impressions regarding it.

I will confine myself entirely to this one pyramid, although there are many others in Egypt.

The writer being a mechanical engineer, will necessarily view it from a mechanical standpoint.

I propose to treat it under seven different heads, namely:

First—Its durability.

Second—Its size and interior arrangement.

Third—Its weight.

Fourth—Sizes and kind of stone of which it was built.

Fifth—How were these stones transported from the quarry to the structure?

Sixth—What kind of labor was employed in its construction?

Seventh—What were the reasons for building it?

The great pyramid was built by Kheops about 2800 years before the Christian era, which makes it about 4700 years old. Nearly everything else in the form of a building of that age has perished, many of them leaving not a vestige behind, but the pyramids stand today little the worse for wear and will stand for thousands of years to come. Of course it is like every other great idea—it is simple.

Its lasting qualities are due to its shape. No form could be devised with more staying qualities than the pyramid form. All other kinds of building decay on both sides while the pyramid, being solid, or almost so, only wastes away on the outside, and even if it wore away at the rate of six inches in a century (the average waste since its completion has been less than three inches in a century), it will be thousands of years before it goes to ruin. It is almost as imperishable as the everlasting hills.

The interior chambers are lined with the most lasting stones that could be found. While enough air was permitted to enter the pyramid to keep it sweet, there was not enough to cause decay in the stones, showing that the builders understood the science of ventilation, and also the fact that if too much air were admitted decay would take place. As it is now decay in the interior has scarcely begun.

The size of the pyramid was originally 768 feet square on the bottom, and 482 feet high, and covered about thirteen acres. It is now 750 feet square

and 451 feet high. The outside coating has nearly all disappeared by the ravages of time, relic hunters, and builders using the stones for other purposes.

The accompanying sketch shows the outside slope of the structure and the shape and size of the interior passages and chambers. The entire pyramid is built of stones, most of which were quarried at a distance of twelve miles from where it is built. The black granite which is used in part of the passages and for the lining of all the interior chambers is found about 580 miles up the Nile River, near Assuan.

The stones forming the body of the pyramid show a width of step of about 27 inches by a height of about three feet. Of course there is no place where the horizontal dimensions of the stones can be determined, but it is likely they would be 3½ to 4 feet at least. The lengths can easily be seen, and they vary from 4 to 24 feet.

The whole exterior of the pyramid was covered with flat granite stones laid in cement. This stone covering is about 3 feet thick and only a small portion of it is now in place. This covering made the finished appearance of the pyramid and covered up the entrance to the interior.

The entrance on the north side, about 48 feet above the ground, is not in the center of the side, and was evidently put where it is to mislead any who would search for it. It was only after the outer covering was partly removed that the opening was discovered and the interior could be explored.

The entrance passageway is about 3 feet 4 inches wide, and about 4 feet high, and descends at an angle of about 26½ degrees for a distance of about 320 feet. It then joins into a horizontal passage about 28 feet long, which terminated in a subterranean chamber about 100 feet below the foundation of the pyramid, cut in the solid rock, about 46 feet long, 27 feet wide and 10½ feet high.

At the junction of the passageway to the king's and queen's chamber and the main passage, a stone of black granite was fitted to block the passage (which stone will be referred to later on).

When the explorers came to this stone they thought it was not the end of the passage, and tried to cut through it. They found it so hard that they finally cut around it through the softer stone and came to the passageway on the other side, which ascended at about the same angle as what was thought the main passage descended.

This passage continued to ascend for about 125 feet, and entered into the great hall which is about 155 feet long, 28 feet high and varying in width from 3 feet 4 inches at the bottom to 7 feet at the top.

The lining of the great hall is of fine grained limestone, and the joints of the stone are perfect. None of the stones in this hall are excessively large, but the workmanship on them is perfect, the joints being so close as to prevent the insertion of the point of a needle.

In the sides of this great hall were niches for the sarcophagus. In the smooth floor were foot holes for the feet, to prevent slipping. At the end of the hall is a horizontal passage about 22 feet long, which leads into the king's chamber.

The king's chamber is 34½ feet long, 17 feet wide and 19 feet high, and the floor is about 140 feet above the base of the pyramid. It is lined with hard black granite, some of the stones being quite large. These stones are about 10 feet 3 inches square, the thickness being unknown, and as the ancients did not veneer their work, let us suppose them to be 8 feet thick. If this is so, the stones would weigh about 64 tons (we will refer to this subject again).

The joints of these stones all round were perfect, not only as regards their closeness, but the adjoining stones matched them perfectly in plane, which means that the faces were in a true plane. This is the true test of the mechanic.



The Great Pyramid

To the mechanic a true plane is one of the most difficult things to make, and they were true planes.

When we come to sculpture, that is the artist, but to make a true plane requires a mechanic of the highest order. The stones that spanned the roof were also large and true, and the joints close.

There were no relics in any of the passages or chambers. What they did contain was removed long ago. The only thing left was what was supposed to be a sarcophagus of granite, with the lid or cover gone, and no inscriptions on it. It was 7½ feet long, 3 feet 3 inches wide and 3 feet 4 inches high. Some writers claim that this was the standard measure of wheat. We often hear the remark, "So many quarters of wheat," and it is claimed that this stone holds exactly four quarters, which is the standard measure. Whatever it may be, it has no mark of any kind on it. It is silent.

Leaving this chamber, with its overhead chambers (reached by a ladder only, which we did not visit), we retrace our steps back to the lower end of the great hall, where a horizontal passage, about the same size as the others, 135 feet long, leads to the queen's chamber.

The queen's chamber is about 19 feet long, 17 feet wide and 20 feet high. The same good workmanship is visible here as in the king's chamber. Near the entrance to the passage to the queen's chamber is a shaft leading down vertically about 100 feet, thence curving to meet the lower passageway about 70 feet from the lower subterranean chamber. This shaft and the subterranean chamber we did not visit, as they were simply a repetition of what we had already seen.

This pyramid originally contained about 94,720,000 cubic feet of solid masonry, and now contains about 84,518,000 cubic feet, having lost only 10 per cent of its weight in 47 centuries. If it wasted away in the future at the same rate it would be 42,300 years until it was all gone.

Taking the average weight of the stones of which it is built at 165 lbs. per cubic foot gives us the original weight of 6,933,000 tons. Its present weight is about 6,225,000 tons. What a large quantity of material to be massed together in one place; some of it found in the neighborhood, a large portion brought about 12 miles, from the opposite side of the river, and some brought from a distance of about 580 miles up the Nile.

None of the stones used in its construction were extremely large. The largest the writer saw being the one already mentioned in the side of the king's chamber, which was about 10 feet 3 inches square, and supposing the thickness to be say 8 feet (it could not be measured, as it was built in the wall), would weigh about 64 tons.

The stones which show on the outside of the pyramid measure about 3 feet in height. They would be 3½ to 4 feet in width and range from 4 feet to 24 feet in length, and the largest of them would weigh about 27 tons. When we compare these weights with the stones in one of the temples at Balbeck in Syria, the largest of which are 64 feet long, 13 feet wide and 10 feet high, and weigh about 612 tons each, the size does not impress us. These were brought across a ravine several miles away from the building.

The writer has seen the statement in a magazine that the pyramids were built of concrete or artificial stone. This particular pyramid, which is the largest and believed to be the oldest, is not composed of concrete or artificial stone.

Neither is the Sphinx which is close to it. The grain of the stone is quite plain and altogether different from any artificial stone. I have read the description of the other pyramids and find no mention of them being of artificial stone, the writers telling in each case from which quarries the stone was taken.

There are three kinds of stone in the pyramid. The interior body is of yellow limestone found in the neighborhood. The outer stones and part of the passages are of finer white limestone found on the opposite side of the Nile in the Mokattam, 12 to 14 miles distant. The lining of the king's and queen's chamber and the stones used to block the passages after the coffins were in place were of very hard black granite, which is one of the most lasting and hardest stones in existence.

This stone is found about 580 miles up the Nile from where the pyramids are built. Many of the statues in the museum at Cairo are made of this stone and the red granite, some of which are as old as the pyramids, and so far as the stone is concerned they show little signs of decay. Some of them have pieces broken off, but the stone itself is in good state of preservation. The design is stiff and not to be compared with those of a later period, but the workmanship is good and they must have had good tools to cut that extremely hard stone.

* * *

An Important Omission

A Wisconsin editor was visiting in Chicago and decided to buy a new Panama hat. Going into a store, he asked the price of one that looked good to him.

The clerk replied, "Fifteen dollars."

Whereat the editor asked, "Where are the holes?"

The clerk appeared bewildered for a moment, but managed to ask, "What holes?"

The editor replied, "The holes for the ears of the ass that would pay fifteen dollars for a hat like that."

* * *

There is more profit in increasing your income than in cutting down your expenses. Work for the profit.

* * *

Always meet people with a smile—if it's your turn to treat.

Points of Law for Architects

PARTIES competent to contract may make such terms as they see fit, and will be held to the performance according to such terms. So it has generally been held that provisions in building contracts that the work shall be done to the satisfaction of the architect, or that payment shall be made only upon the presentation of the architect's certificate, are binding and must be complied with before the contractor may recover the compensation to which he is entitled upon the performance of his contract. In adjusting the claims of the parties under building contracts, which provide for payment upon the presentation of the architect's certificate, the courts look not merely at the naked words of the contract, but at their real meaning, reading them in the light of experience, justice and common sense.

The certificate of the architect may be, and doubtless is in most cases, a very proper means of ascertaining whether the contract has been performed, but to say that it is the only means of determining that fact, does not accord with common experience, and is not supported by the authority of adjudicated cases.

If the architect, whose certificate the contractor is required to present, fails or refuses to act in the matter, the certificate then ceases to be essential to the contractor's right to recover. In McDonald vs. Patterson & Co., 57 N. E. Rep., 1027, the parties had entered into a contract for the erection of a hotel and bank building in Danville, Ill. Final payment was to be made upon the certificate of the architects within ten days after completion of the work. The owners refused to pay the contractor on the ground that he had not presented the architect's certificate that the work had been done to their satisfaction, as required by the contract. The contractor showed that the architects, who had their offices in Chicago, were employed by the owner and refused to go to Danville for the purpose of inspecting the work, unless so directed by the owner, and as the owner would not give such directions, the architects did not see the building and could not issue their certificate. The evidence was held to justify an inference that there was collusion between the owner and his architects which obviated the necessity of obtaining a certificate.

An architect in employ of a city was appointed to act as arbitrator under a contract for the construction of waterworks, to which the city and a contractor were parties. The architect was empowered to direct the contractor to do extra work with the approval of the city council and to decide all questions which should arise relative to the installation of the waterworks by the contractor. After the works had been substantially completed to the satisfaction of the architect, and had been in the use of the city for three months, a break and leak occurred in the settling basin which rendered them unfit for use. Thereupon, by direction of a committee of the city council, the architect notified the contractor to repair the basins and to make them water tight, or that the city would do so at his expense. The contractor replied that he was not responsible for the break and refused to remedy it. In an action by the city against the contractor it was shown that the architect had given his final certificate as to the proper completion of the work and had determined that the 15 per cent which was to be retained until the work was finished, was due and payable to the contractor. And it was held, accordingly, that the authority of the architect to act as arbitrator had ceased and that his mere direction that the contractor repair the break did not make such work a legal obligation upon the contractor.

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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Next Convention at Washington, D. C.

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Plans for San Francisco's New Municipal Buildings

Proposed plans of a general nature for the erection of two new municipal buildings in San Francisco to replace the old city hall and the building of a mammoth auditorium on the present site were enthusiastically discussed at a recent meeting of the reception committee of the California Promotion committee at which the members of the board of supervisors and other city officials were guests.

Supervisor Loring P. Rixford explained the project which recently has been given careful attention and study, and a strong sentiment in favor of the improvement was manifested. The plan, as outlined, contemplates the purchase by the city of a strip of land 100 feet wide on each side of Marshall square, extending through from Market street to City Hall avenue. On each of these parcels of land a modern eight story building would be erected—one for the use of the courts and allied departments and the other for general administrative offices. The present city hall ruins would be entirely razed, and on the same site would be erected a great auditorium.

The auditorium idea is the outcome of the plans of the California Promotion committee to make San Francisco one of the greatest convention cities of the United States. Such a building as the one proposed would be in some respects similar to Madison Square garden in New York city, having a seating capacity of from 15 000 to 20,000 and a removable floor laid over ashphalt or concrete, that would allow of its conversion into a huge hall for horse shows, expositions, sporting events, aquatic carnivals and the like.

As a result of the meeting, it is probable that City Architect Tharp will be asked to prepare rough outline plans and estimates of the general design and cost of such a group of new buildings. The estimate discussed was $1,500,000 for the departmental buildings and from $1,000,000 to $1 500,000 for the auditorium.

Certificated Architects.

The following architects have passed a satisfactory examination by the State Board of Architecture, and have been granted certificates to practice their profession in this state:

Otto H. Neher, 601 Pacific Electric Bldg., Los Angeles.
R. Myron Woolpert, Alhambra.
Leonard A. Cook, Santa Barbara.

Fine Building for Los Angeles

With the completion of the new fireproof office building of the Pacific Mutual Insurance Company, at Sixth and Olive streets, Los Angeles, one of the most substantial and artistic structures that has been erected in the city has been perfected. The building was designed and supervised by architects Parkinson & Bergstrom. It is a five story and basement building, of reinforced concrete construction, faced with glazed terra cotta and of the Corinthian style of architecture. Every known modern feature for the convenience of the occupants has been provided for and from basement to roof the equipment is of best quality.

Mr. Allom Addresses San Francisco Chapter, A. I. A.

By SYLVAIN SCHNAITTACHER, Secretary.

SAN Francisco Chapter, American Institute of Architects, held its December meeting at Taits on Thursday evening, December 17, 1908. The members present were: Albert Pissis, president; Wm. Mooser, vice-president; Sylvain Schnaittacher, secretary; Wm. Curlett, Clinton Day, Chas. W. Dickey, John Bakewell, Jr., Geo. B. McDougall, Geo. Rushforth, Ira Wilson Hoover, Geo. Albert Lansburgh, G. A. Wright, E. J. Vogel, Frederick D. Boese and T. J. Welsh. Mr. Charles C. Allom of London, England was present as a guest of the Chapter.

After the transaction of routine business, Mr. Allom gave the Chapter some very interesting remarks, a synopsis of which follows:

Mr. Allom stated he took great pleasure in being at the meeting; that he represented three generations of architects, but his own professional practice had more to do with interior decoration. From his first visit to America five years ago, he was gaining a greater interest and respect for American buildings and the architects of this country. He called particular attention to the work of Messrs. McKim, Meade & White; to the skill and attention they have shown in utilizing classic detail in large public buildings. He stated that in Europe the public had apparently tired of the classic detail, but he felt Europe had a great lesson to learn from the American tendency to apply Roman detail to its buildings.

He spoke of the admiration and regard he had for the work accomplished and good taste displayed in designing the new buildings for San Francisco.

Mr. Allom stated that he was Chairman of the architectural section of the forthcoming Imperial and International Exhibition to be held at Shepard's Bush, near London. He stated that the buildings would cover from forty-six to fifty-two acres of ground and would contain the special products of all countries, specializing on the products for which each state or country was famous. He asked that a representative display be sent from this country, of our architectural work, stating that the American architect was much too modest in regard to his efforts; and closed by again stating the great pleasure he took in the originality and progress of American architecture.

Honor for Architect Brown

Architect Arthur Brown, Jr., of the firm of Bakewell & Brown, of San Francisco has been awarded the first prize of $125 for his design of the Sloat Monument, to be erected in Monterey, Cal. Architect Brown will perhaps be awarded the work as his design was acceptable to all parties concerned. Mr. Brown spent a number of years in the Beaux Arts School, Paris.

Engineer Breite in New Office

W. W. Breite, the well known structural engineer whose offices since the fire have been on Golden Gate avenue, San Francisco, has joined the down-town movement and is now located in spacious quarters in the Clunie building at the corner of California and Montgomery streets. Mr. Breite is, without doubt, one of the most capable structural engineers on the Pacific coast.

Architects Seek Writ

E. H. Denke and A. R. Denke, San Francisco architects, have petitioned the superior court for a writ of mandate compelling the State Board of Architecture for the northern district of California to issue to them certificates to the effect that they had been practicing their profession in California for five years immediately preceding March 23, 1901. Under the terms of legislation adopted on that date by the state legislature architects who had practiced in California for five years or more were entitled to a certificate without undergoing an examination. The Denkes assert that the only reason the board has refused them certificates is that they are engaged in the building contractor's business.

Ability Recognized

Wilbur David Cook, Jr. landscape architect, Los Angeles, has been employed by the Park Commission of San Diego in a consulting capacity on their work in the City Park, 1400 acres. Mr. Geo. Cooke was engaged on this work at the time of his unfortunate accident and death, some time ago.

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"PITFALLS IN PRACTICE"

We have heard many comments upon an article, "Pitfalls in Practice" in our August number, an article that was reproduced from the London Building News. The subject is a most serious one and one fraught with difficulties. The architect's position is an anomalous one at best. He is supposed to be the judge in equity as between owner and contractor, yet he is in the employ exclusively of the owner, whose interests and desires are generally, if not always, inimical to those of the contractor. On the other hand, as a rule, owners and architects seldom move in the same social or business sphere. Architects and contractors and manufacturers of building materials are thrown much together. Their interests are common, their lines of endeavor place them in contact and perfectly legitimate and natural friendships ensue. Yet, the moment an architect and a contractor appear to be at all friendly the carpers and faultfinders shake their heads and whisper mysteriously, "there's something wrong doing." It is all too bad but what's to be done?

It would seem that the more architects and manufacturers of building materials and contractors got together, interchanged ideas and compared notes the greater and more rapid would be the advance in the building art. Practice and Experience would help Theory, and the latter would give new impetus to the former. But it doesn't seem to work that way. There appears to be an underlying and sinister current of resultant evils from such friendships. The whole practice of architecture could well be revamped, reorganized. There are endless possibilities for good in such a work, but it is a matter that should be discussed and carefully thought out and weighed. We have nothing to suggest offhand except just one little detail and that is that as a preliminary to such revamping, reorganization, our architects should pay the very greatest attention, not only to art and to practice, but to the upbuilding of—personal character.

CITY BEAUTIFUL AGAIN

There certainly is room for optimism in regard to the artistic redemption of our cities. Everything points to it, our architectural journals teem with matter in connection with it, the daily papers quote from them, and the people are becoming familiarized with such plans. The result is cumulative, like the rolling of a snow-ball, gathering size and momentum as it is pushed along. A little illustration of this growth, or really change of heart on the part of cities and great corporations may not be amiss. In a personal letter Mr. Fitzpatrick tells us of the herculean efforts he had to make some fifteen years ago or more to get a certain railroad president to expend a few hundred dollars in removing some unsightly features of a railway approach to a city. There was much grumbling and that officer finally did it simply "as a personal favor" to a "kicker." That same company and under the management of that same president has this year voluntarily and freely spent many millions of dollars in building attractive stations and in improving the appearance of roadway, etc., essentially artistic details and things that will not produce one penny of direct return. And from railroads this desire to do things nicely will spread. It is contagious. We have the richest and biggest cities on earth, why should they not also be the most beautiful?

THE ILLUMINATING ENGINEER AS AN ARCHITECTURAL CRITIC

Mr. Bassett Jones, Jr., discusses the below topic in the Electrical Review of September 12th, as follows:.

"If the illuminating engineer criticized lighting fixtures only, and only as fulfilling or not fulfilling engineering requirements, the architect would have no complaint to make. But the engineer as engineer has been emphatic in his opinion as to the artistic value of many lighting installations, and, not satisfied with this, he has extended his criticisms to architectural treatment in general."

Mr. Jones' opinions are correct in a general sense, but we think the illuminating engineer is entitled to the same privilege enjoyed by every freeborn citizen—the right to criticize, no matter if it be architecture, sculpture or art. When the illuminating engineer criticizes the architectural features of a building he does so, not as an engineer, but as a layman, which we think is entirely within his rights. An Eastern contemporary, taking a more radical position, goes on to say that:

"Buildings are not put up for the use of architects, and it is really of little consequence what architects think of them. Whether the drama, the poem, the novel, the painting, or the building, is or is not worthy of commendation is decided by those who know little or nothing of the technology connected with their production. By taking up the profession of illuminating engineering a man by no means abdicates his right to express his personal like or dislike of any work of art or artisanship."

Thinks Brick Superior to Concrete

The good old brick, which has been shoved back to second place as building material since the advent of reinforced concrete and tiles, has a vigorous champion in T. J. A. Tiedemann, who addressed the Fire Underwriters of the Pacific on building construction and rates at a recent meeting. As fire-resisting material Tiedemann gives brick first place and produces the evidence to prove it. In consequence he believes that in the fixing of rates, buildings with brick walls should be given a more favorable premium than tile or reinforced concrete. As it is, there is no difference in the rates.

In this connection Tiedemann expressed the belief that a brick foundation could be as good as or better than concrete and gives instances of foundations recently dislodged which were perfect, although in wet ground for over forty years.

The cause of the appalling increase in fire losses in this country he attributes to poor wiring. "Boys and novices put in the wires in the most haphazard way," he said, "and the inspecting is a joke. Our construction laws in this regard, as in others, are too often lax and are practically never enforced properly. Our losses in this country, in spite of our flimsy construction, could be lessened 50 per cent if the building laws were properly enforced."

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

Gravity Heating for a Residence with a Warm Air Furnace.

By an Old Timer.

WHAT is a proper installation for a warm air furnace? To answer this question, we will have to generalize somewhat to begin with, and perhaps may say some things that will not set well with some that think they know, and, in what is said, we do not want it to be understood that the writer is an absolute authority on the subject, but a student, who has received many a jolt, and wishes to pass them on to others, in order that they, too, may profit. Remember that you cannot do a good deed for your neighbor, unless it is returned to you by natural law, therefore, if what can be said in these articles result in better work, so much the better for all of us, and the prestige of the warm air furnace, as a means of comfort in our homes.

The architect has prepared plans for a residence, and to it he has applied his best knowledge. The exterior may command the admiration of the beholder, the interior may be a dream in its beauty, everything in connection with its finish and appurtenances may be of the best that thought and money may procure. By means of a catalogues containing illustrations and examples, which are accurate and exact, the architect has been educated to the point where he can select and specify what is fitting, or out of his knowledge he can design a stairway, a color scheme or any special part that is needed to make up the structure into a beautiful whole until it comes to the heating. Unfortunately, this seems to be the lasf consideration, and again the manufacturers of warm air furnaces have never furnished the architect any reliable data on which to base calculations for heating, if he were disposed to treat the subject as it deserves. So on the whole it is not fair to blame the architect only, but the manufacturer as well, for his neglect of an important part of the building.

Following this comes the dealer in warm air furnaces, who, in a majority of cases, is as ignorant of the heating subject as a Hotentot but as long as he is able to make the price he gets the business independent of any or no knowledge on the question. The result is obvious. Some one is going to get stung. Now then, an architect is calling for bids for a residence; everything except the heating is plainly called for and specified, even to detail and catalogue number, and here is where the poor furnace man gets his; there is usually a round spot on the basement plan to indicate the position of furnace, and perhaps there are marks in the different rooms showing locations of warm air outlets; then the specifications will say that the furnace shall be of sufficient size or capacity to heat the building to 70 degrees in the coldest weather, etc., etc. Bids are received and opened—one heating man wants $350,000 for a job and specifies clearly what he will furnish—the evident intention of the proposal being a first class installation. Another bid will be for $225.00, and, of course, the architect wonders where the difference can come in, as both firms are supposed to be equally responsible financially for any undertaking they propose.

* * *

Now, the reason for the architect's indecision is this—he has never investigated either one of the proposer's goods, or his method of installations, consequently, he is in no position to judge, and unless he is disposed to be of an investigating frame of mind, he awards the contract to the lowest man, and, in case that he does, we grant that he usually gets a job that will heat the house. So will a 1/8" stream of water fill a barrel if you only give it time, but we all know that a 1" stream will fill the barrel more quickly. A warm air furnace heats by filling the space to be heated with warm air; also any means of heating costs money every time you use it, therefore, it is a reasonable

supposition, that the furnace which has a capacity to warm a house in twenty minutes is preferable to one that takes an hour to do the same work. And this is the meat of the whole matter—to try and get a fair investigation of the warm air furnace, first by the architect, for we know that he wants to give his client the best, second, by the owner, who owes it to his own purse and comfort of his family to secure the best, and lastly, both the manufacturer and the dealer to learn their business well enough to be able to give information that is real information and not guess work. When they do this, then will the architect and owner begin to have respect for what they offer.

In another article we will follow up this same question, not being permitted the space at this time to complete this phase of the question.

An Innovation in Lighting

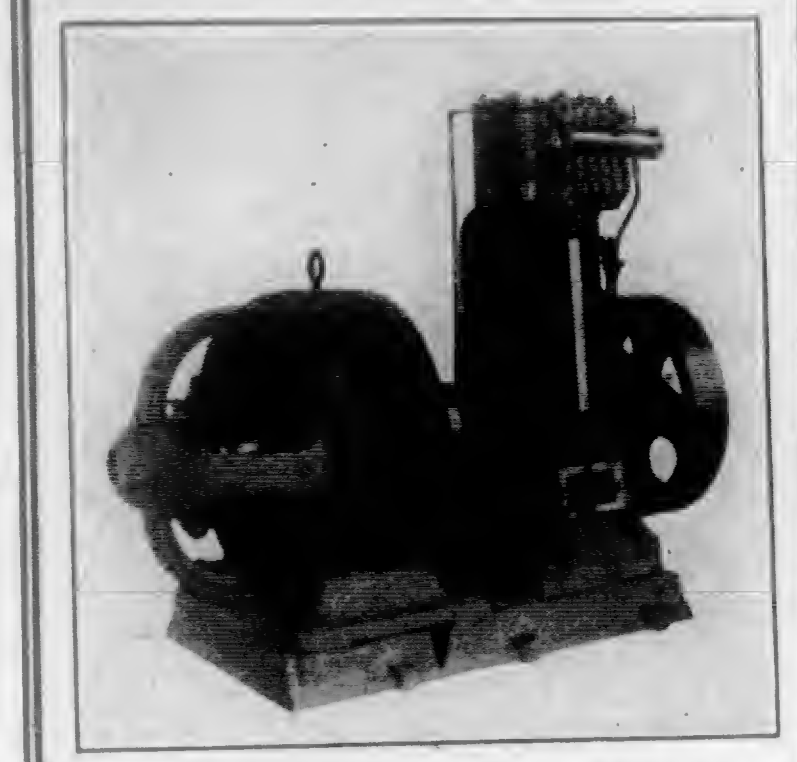
The Illuminating Engineering Society, organized to advocate systems of artificial lighting less destructive to the eyesight than the ordinary incandescent burner, recently held a meeting in the St. Gabriel's Park Branch of the Carnegie Libraries in New York. The building was lighted according to designs prepared by the distinguished member of the society and which have been adopted for the lighting of similar buildings in the future. Among the innovations may be named the following: A lamp for a reading table outwardly resembling the ordinary green-shaded burner, but provided with a reflector which equalized the amount of light, so that a book placed upon the outermost edge of the table received quite as much light as the one directly under the lamp. Another sort of reflector over the book racks makes the illumination there uniform, so that titles on the lower shelf may be read as easily as those nearest the light. An entirely different arrangement is employed to light reading matter in a horizontal position from that position. No incandescent lights are left unshaded; and there is a careful distinction made between local and general lighting so that no power need be lost in supplying general illumination where light is needed only for reading purposes.—The Brickbuilder.

The Sub-Contractor Has His Troubles

To the Editor of The Architect and Engineer:

The sub-contractor is without doubt the most abused man connected with the building industry and as a rule it is the fault of the general contractor. This ought to be stopped, and it behooves every reputable architect and general contractor to see that it is.

The following incident is given to illustrate what the writer is getting at:



An architect sends detailed plans and specifications to the general contractor, asking for his bid on a certain building in its entirety—he in turn calls for figures on the many different things that go to make up his total bid. Some general contractor is awarded the job on the very figures that several sub-contractors have furnished him. Does the general contractor drop Mr. Sub-Contractor a note informing him that his bid is accepted and he would like Mr. Sub-Contractor to call and sign contract for his part of the work? No; the general contractor drops notes asking for more bids. He lets every brickman, millman, electrician and so on down the line figure the job, and more than likely the general contractor will get a bid from these "firms" that is much lower than the bid the reliable sub-contractor furnished him in the first place. The general contractor closes up with some of these "firms" and naturally saves considerable money before he begins work, at least he thinks he does. Is that fair to the man who furnished the bid that got the job for the general contractor? Think it over.

If you have had any experience in the building line you ought to know that there was never a plan or specification drawn up that didn't have some loop hole or technicality in it. The "contractor for a day," or cut throat contractor, as he ought to be called, is just waiting for such an opportunity, to make a claim that such and such item is not in the plans or specifications, or vice versa. Of course that will cause an argument. Now, why have these troubles? You wouldn't, had you taken the bid of the reliable sub-contractor when he was really entitled to the work.

The sub-contractors are willing to figure—that is part of the contracting business—but for the general contractors to peddle and juggle bids is a bad precedent, yet it has been going on in San Francisco during the past year to an extent that is almost beyond belief. Let's

cut it out; begin the new year right and give every one a chance to make a little money, and don't try to get work done for nothing.

A SUB-CONTRACTOR.

Portland Architectural Club.

The first meeting of the Portland Architectural Club in 1909 was held in the Club rooms on the evening of the first Tuesday in the year. There was a large and enthusiastic attendance.

The second annual exhibition of the Club will be held from March 22nd to April 10th and promises to be a great success from every point of view, surpassing their former efforts in every way. Much valuable work is promised from the East. All architects in the Northwestern part of the United States have been invited to co-operate and their responses are very encouraging. It was fully decided to accept for exhibition building materials of a decorative and artistic character, and all manufacturers and agents of the goods of this class should write the President, Mr. Jacobberger or the Secretary at once. Monthly competitions are now a regular feature of the students' section of the Club, which works under the direction of the Educational Committee.

Fourteen contestants submitted work at this meeting.

First Problem: Masonry and Drawing, Skidmore Fountain—Special mention, Mr. Linde; special first mention, Mr. Hall; second mention, Mr. Allyn; third mention, Mr. Tanner.

Second Problem: A Monument to Three Illustrious Men—First mention, Mr. Rosenberg; second mention, Mr. McKenzie; third mention, Mr. Allyn; fourth mention, Mr. Combs.

The announcement of the third problem was made, viz.;

An architectural treatment of the source of a spring.

This will take place the first Tuesday in February.

The Club has a committee at work to agitate the question of creating an Art Commission for Portland. The city is to have a new charter and a body of prominent citizens under the title of the Charter Board are at work devising new fundamental laws for the city, among other things an Art Commission. This will be a novelty as well as a step in advance of the other cities of the Coast. The functions of this body would be to pass upon all public buildings and to examine their propriety, design, artistic and utilitarian sufficiency and to propose changes if necessary in their plans, supervise the location of public fountains, arches, statuary and works of decorative and memorial character. While the present intention is to confine the powers of this Board to public buildings and monuments there is hope that, officially exercised, the influence of this Board would prevent any unsightly and shoddy architecture on private and semi-public buildings. The special committee of the Charter Board having this matter in charge has given the Club much encouragement.

Portland Is Goin' Some.

By Albert J. Capron.

The legend runs: That a colored gentleman, in an unguarded moment, bet with a white man that he, the colored man, dare go through a cemetery in the night.

The bet was "covered" and on the appointed night the white man arrayed himself in a winding sheet and hid his ghostship behind a tombstone. Who can blame anyone, under the circumstances, looking back, much less a colored man, who on perceiving the ghost behind him commenced running and the faster he went the faster likewise his ghostship.

When the colored gentleman had run out of breath, he sat down to rest, whereupon for the first time the ghost spoke up and remarked that they "had been going some," to which the darkey replied, "Yes, we done gone bin goin' some and yo bet your sweet life we'll be goin' som' mo when I catch ma breaf."

The above about expresses the situation as regards the building operations in Portland during the past twelvemonth and we are "goin' some" more as soon as we can get our breath, which fortunately we will be able to do.

A year ago we predicted, through the columns of your journal that 1908 would be essentially a warehouse and residence year, and in the highest sense it has been such, and while there have been some business blocks erected, to be mentioned later, yet the great burden of expenditure has been for warehouse space, notoriously scarce heretofore.

The residences have come in for an unusually large share of construction, not hundreds, but thousands. "Jonah's gourd" was supposed to have sprung up over night; the residences are springing up night and day and the class as well as the character of construction has been without equal heretofore. It is safe to say that more than as many again residences were constructed during 1908 than for any like period in the history of Portland, and that the expense thereof has been not only as much again, but quadrupled by virtue of the fact of the high grade of construction. We might mention as a fair illustration that choice residence section, known as Irvington, almost within pistol shot of any given point, where more than one hundred dwellings have been erected, not one of which cost less than $5,000. And what is said concerning this section applies equally well elsewhere.

In Portland as well as in other places there are a class of architects whose principal work has been in the line of dwellings and these have had their inning this year.

For warehouses we would scarcely know where to begin or end.

Of churches, many have been completed and several are in course of construction, plans being drawn for others.

School buildings and additions thereto, while numerous, they scarcely kept pace with the multiplication of our population of school age.

The Meier & Frank Building, A. E. Doyle, architect, marks a magnificent type of modern construction, some ten stories in height and affording an addition to their already half-block giving nearly an entire 200-foot block, all devoted to the retail department store for the above firm. Thompson & Starrett Company, who are doing the erecting, are showing rapid progress in this work.

The C. K. Henry building will also be a very fine building of white enamel brick and terra cotta, being the first of this type of construction here. The Lombard building, reinforced concrete construction, occupying a half block, twelve stories high, is in process of erection, while the Fenton building, the addition to the Oregon hotel, Beck, Board of Trade, Gerlinger and many others of this character of business blocks, have just been completed and tenants have moved in. Excavating has been completed for the Lewis Estate building.

The rebuilding of the Abington building partially destroyed by fire, will make it practically fire-proof and modern in every respect.

Another type of building, one in which Portland has long stood in need, is the Portland Public Market & Cold Storage Company, Messrs Goodrich & Goodrich, architects and engineers. This will be a three-story, reinforced, concrete building, using the General Fireproofing "System" and occupying an entire block. The basement will be used for a cold storage plant with a railroad track running on to the first floor, bringing refrigerator cars in and by an elevator system lower the cars into the basement, the contents being transferred without coming in contact with warm air. That this building will be a great success goes without saying. Already nearly the entire space has been leased, contracts signed and money deposited, assuring an income beyond most sanguine expectations. While a stock concern yet there is none for sale, it all having been taken over promptly.

This improvement will mark an expense of between $500,000 and $600,000, the building being erected on a block recently burned over located near the Union depot. The space has not only been taken by local people, but Tacoma, Seattle, Spokane and San Francisco merchants as well. The first floor will have stalls, the second floor a department store, etc.

If we were to recapitulate the figures month by month it would take rather too much space; it is enough to say that more than $10,000,000 has been actually spent during the year. The lowest amount for one month was $625,000, running from that to $1,250,000. While the permits do not give the actual value yet for comparison we submit the following, taken from "The Oregonian":

	1907		1908	
	Permits	Valuation	Permits	Valuation
January	218	604,475	298	625,545
February ...	278	886,748	413	833,800
March	295	659,729	544	851,845
April	389	1,526,777	576	980,410
May	481	1,152,732	374	754,945
June	382	865,250	385	841,065
July	374	762,371	459	1,038,366
August	389	881,360	412	772,395
September ..	362	943,300	445	972,355
October	422	645,585	368	829,755
November ..	162	199,210	297	944,595
December ..	138	319,245	278	960,075
Totals	3890	$9,446,982	4851	$10,411,951

Building permits issued since 1900 by years, as follows:

	Permits	Valuation
1900	392	944,985
1901	745	1,529,143
1902	1244	2,730,660
1903	1628	4,281,056
1904	1720	4,029,225
1905	2318	4,183,368
1906	3166	6,902,032
1907	3890	9,446,982
1908	4851	10,411,951

PORTLAND

	1908	1907	Per Cent Inc.	Dec.
Bank Clearings	$310.656.513	$350.932.422	..	11
Building Permits	10.528.066	9.410.137	12	..
Real Estate Transfers......	20.308.506	23,450,140	..	12

SEATTLE

	1908	1907		
Bank Clearings	$429.499.251	$488.591.471	..	13
Building Permits	13.777,329	13.573.270	1.5	..
Real Estate Transfers....	37.926.186.91	56.519.206.40	..	38

SPOKANE

	1908	1907		
Bank Clearings	$307.791.482	$298.576.950	3	..
Building Permits	5.927.548	5.778.876	5	..
Real Estate Transfers...	not reported	19.827.518	..	..

Portland has great reason to congratulate herself that she is "goin' some." True, the "grim reaper" has been a little derelict in his work during the last few generations, but fortunately he has reaped his harvest among that class of fossilized wealthy men, who receive, but give nothing.

The character of construction is metropolitan. The progress manifested in said construction has been probably greater than any city on the Coast. Indeed, Portland is so much on the map that when others do not congratulate us we congratulate ourselves, and while wishing all other Coast cities health, wealth and prosperity, we are not going to forget that we want some of it ourselves; indeed, are having it—yes, Portland is "goin' some."

By the Way

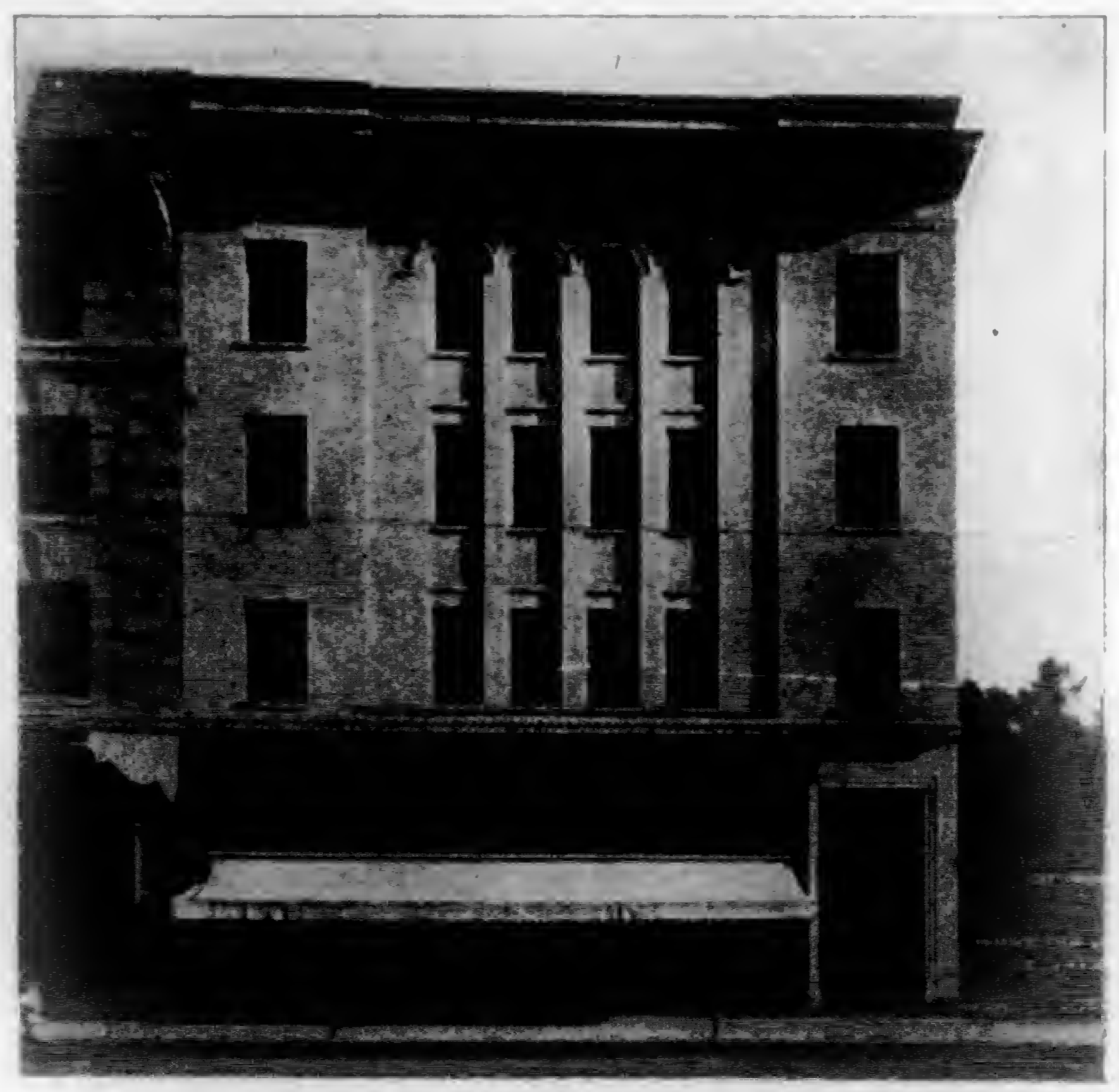
Some Industrial Information Worth the While

Rudgear-Merle Company

The Merle Ornamental Iron and Bronze Company of San Francisco, the Rudgear Steel Company, and the A. Merle Company have been consolidated into a new company known as the Rudgear-Merle Company. The new corporation assumes all obligations of the consolidated companies and will fulfill all contracts and collect all accounts. The officers are, A. Rudgear, president; James F. Leahy, vice-president; A. J. Merle, treasurer, and W. A. Rudgear, secretary. The manufacturing plants of the combined companies are the largest of any similar concern on the Pacific Coast, and the high standing of the three firms is guarantee that the new company will please its customers and enjoy a splendid business.

Erecting Steel for New Buildings

C. A. Blume, the well known erector of steel for Class A buildings, has the contract for erecting the steel on the Techeau tavern at Powell and Eddy streets, San Francisco, also the Gas Company's new building from plans by Frederick H. Meyer. The steel frame of the old Spring Valley Water Company's building is being straightened and put in first class condition by Mr. Blume and some extra steel work is also being added to this building.



Sequoia Hotel Building, Fresno, Cal. B. G. McDougall, Architect

Demand for Russell & Erwin Hardware

William R. Voorhees, Pacific Coast manager for the Russell & Erwin Manufacturing Company, makers of high class builders' hardware, recently returned from a trip East which included a visit to the factory in New Britain, Conn. Mr. Voorhees is optimistic of the future. He thinks the Pacific Coast is in line for a banner year, so far as prosperity is concerned. The people of the East are still marveling, he says, at San Francisco's wonderful strides and it is difficult for some of them to understand how the city could recoup its losses and rebuild along the lines it has in so short a time.

The Russell & Erwin Company enjoyed a splendid year in 1908, many of the most pretentious buildings erected in the East as well as on the Pacific Coast, having been supplied with Russell and Erwin hardware. Mr. Voorhees states that the company expects to place on the market this year an invention which consists of a panic door bolt fastened to entrance doors in theatres, churches, etc., and so constructed that any unusual pressure against the inside of the door will cause it to fly open and release the audience. Some new and very artistic designs in hardware are also going to be marketed by the company this year.

Among the more recent contracts taken by the Russell and Erwin Company in California is the hardware for the Commercial building, Louis P. Hobart, architect, the new Custom house building, San Francisco, and the Tevis residence at Alma, Cal.

Art in Shingle Stains.

In the art world no greater progress has been made in any branch than that of decorating and beautifying the home, hence the advance in architectural designs and color treatment for houses.

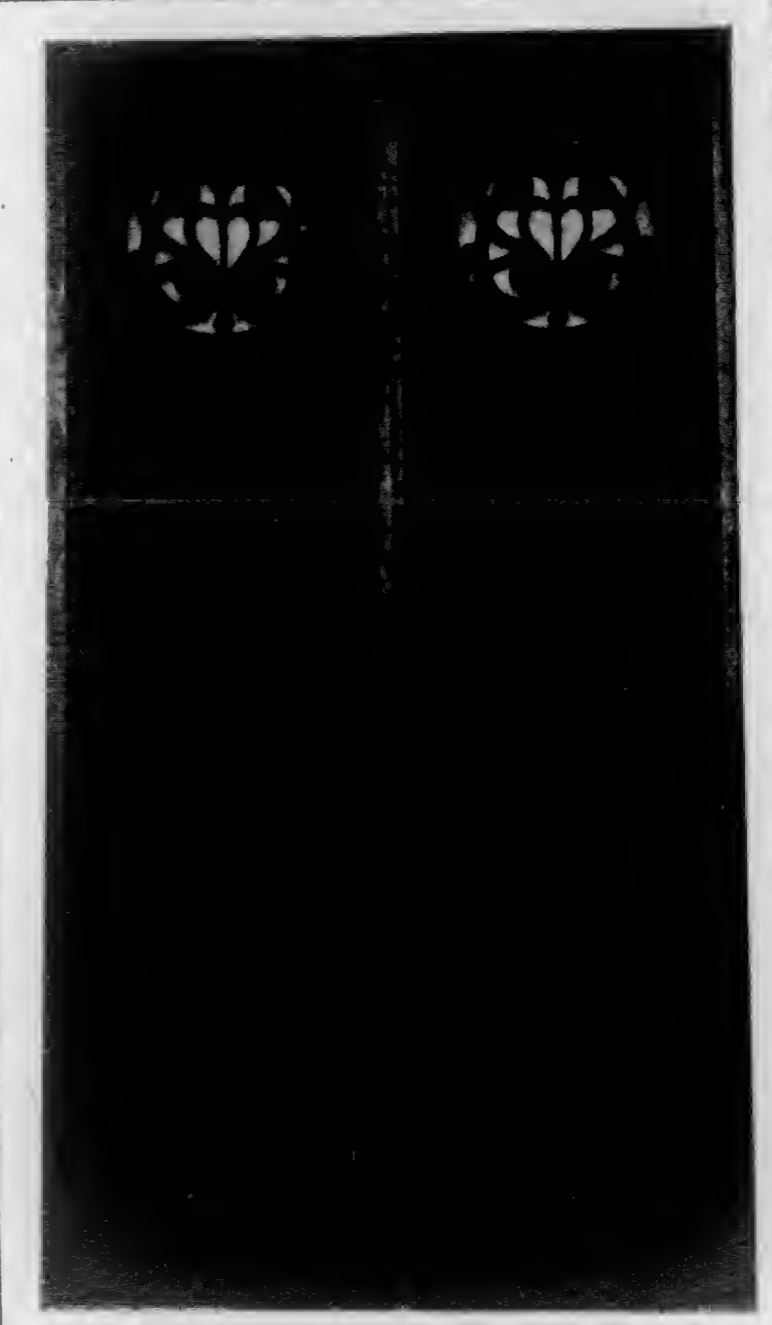
The soft effect and rich colors of the shingle stains manufactured by Parker, Preston & Co., Inc., Norwich, Conn., and named "art in shingle stains," because of the rich tone and exquisite colors, have created a symphony to the home beautiful.

The Whittier, Coburn Company, San Francisco and Los Angeles, being distributors for Parker, Preston & Co.'s, "art in shingle stains," are supplying the coast trade and cabinet of cards, showing colors made, is given free to members of the architectural profession upon application.

Architect Berndt at His Office Again

Architect Francis J. Berndt is again able to be at his office after a very serious siege of blood poisoning, which attacked his right hand, and which occurred at a particularly unfortunate time as such things usually do, his office being crowded with work projected for the new year as well as the finishing and supervision of much important work under way.

He says that working with a bandaged right hand is not the most satisfactory, but is better than pacing the floor nights with a hand that felt as large as a nail keg and as busy as a trip hammer.



Bronze Door to Jas. Flood Building
Albert Pissis, Architect

The E. D. Crowley Company

Of the younger engineers and contractors in San Francisco probably none has enjoyed greater success since the fire than E. D. Crowley, the present head of the E. D. Crowley Company, with offices in the William Wilson building. Mr. Crowley is a Native Son and for more than twelve years he has been following the engineering profession.

Mr. Crowley was formerly secretary and manager of the B. & W. Engineering Company in which company he some time ago disposed of his interests to become president and manager of the E. D. Crowley Company. While with the B. & W. Engineering Company, Mr. Crowley superintended the construction of a reinforced concrete manufacturing plant for the Del Monte Milling Company at Lombard and Montgomery streets, San Francisco. The construction of this building showed the possibilities of rapid work in concrete. The first shovelfull of concrete was placed on the 15th of May and on August 15th the roof was on and the finishing details were being carried out.

The plant consists of a warehouse 50 by 137½ feet and four stories high, a three story building, 87½ by 160 feet and an engine and boiler house. The buildings represent an outlay of about $120,000.

Other work done under Mr. Crowley's direction includes the O'Keefe building, Front and Clay streets, designed by O'Brien Bros., architects, the McKeon building at First and Federal streets, the Hagens building at Townsend and Japan streets, the Painter building at Clay and Sansome streets, the Hirshfelder building at Twentieth and Florida streets, the Erlanger-Galinger building, Sacramento and Dupont streets and the Bernhard building at Jackson and Dupont streets.

Very recently the E. D. Crowley Company has signed two important contracts for the erection of buildings designed by Architects Oliver and Foulkes. One is the Peralta apartment house in Oakland and illustrated in this number of the Architect and Engineer and the other is the Gaffney building at the corner of Sutter street and Grant avenue, San Francisco.

A competent and experienced architect's stenographer, able to take full charge of waiting room and office, seeks permanent engagement. Address, "Typist," 4561-A, Sacramento Street. Phone West 4178.

Asbestos: The New Building Material.

Asbestos has widened the adaptability of cement to building purposes a dozen fold.

Intimately mixed with cement and compacted by hydraulic pressure into a homogeneous concrete, the asbestos fibers cross and recross and interlace in every direction, reinforcing the cement against all stresses, and making it practicable to use cement sheets as thin as an eight of an inch.

Concrete sheets that are made into building lumber, corrugated sheathing, and shingles—that can be worked and cut with ordinary tools by ordinary workmen, nailed where desired—fire-proof, weather-proof, and so tough and elastic that large sheets can be bent around curves.

These asbestos-cement products are made only at Ambler, Pennsylvania, and marketed by the Keasbey & Mattison Company, which is presided over by Dr. R. V. Mattison, "the asbestos king," and owner of the largest and most valuable asbestos properties in the world.

The Mattison mines are located at Thetford and Black Lake, in the province of Quebec, Canada, the asbestos fiber from which is long and silky, snow-white when separated. The mines contain especially rich veins in the serpentine rock, and the asbestos is mined in open pits or quarries.

The crude asbestos must be separated from adherent rock, classified according to length of fiber, and then fiberized—the lumps broken up and the fibers separated.

Short fibers are converted into pipe and boiler coverings, insulation, and so on. The long fiber is carded and spun into yarn, which is further spun into ropes or woven into theater curtains, for insulation against fire and electricity, and a multitude of other specific products.

In making the asbestos building lumber and asbestos "century" shingles, the asbestos fiber is worked into a homogeneous plastic mass with pure hydraulic cement.

The cement is then subjected to tremendous hydraulic pressure, which compacts the cement and squeezes it into every fiber. As the cement hydrates and crystallizes, it locks around the fibers, becoming more and more tough and elastic, until it attains a permanent maximum as the concrete matures.

Fire-proof, weather-proof, vermin-proof, the asbestos-cement products are the building materials of the present and future. Already they are enthusiastically adopted by builders, architects, and house owners in every part of the country—as is evidenced by the attractive folder put out by the Keasbey & Mattison Company, picturing twenty-six asbestos "century" shingle roofs, from Rhode Island to Nebraska, and from Wisconsin to Texas, beside a residence in Porto Rico.

Architects who want to keep in touch with the livest development in building matters should write to the selling agents for information—and mention the Architect and Engineer.

Johns' Patent Door Hanger

The San Francisco Hardware Company reports a good demand for the Johns' patent parlor door hangers. The hangers are made for single as well as double sliding doors and are double ball-bearing. They are exceedingly simple and absolutely noiseless. Many of the best homes in San Francisco and vicinity have the Johns' door hanger and they are also being used quite extensively in apartment houses and flats. The San Francisco Hardware Company, 3069 Sixteenth street, are the authorized agents of the Johns' hangers.

Successful Test of Chemical Engine

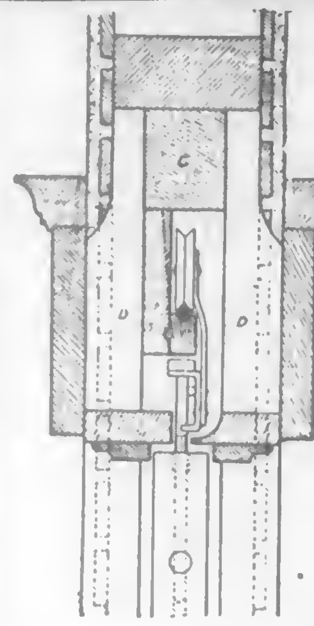
A highly successful test of the Kenawha chemical engine recently built by the Kenawha Chemical Engine Manufacturing Company, L. E. Boyle Company, 100 Front street, San Francisco, western agents, for the town of Berkeley, was held recently under the direction of the Fire Chief of Berkeley and S. T. Wallace, vice-president of the L. E. Boyle Company. The Berkeley Reporter has the following to say of the demonstration:

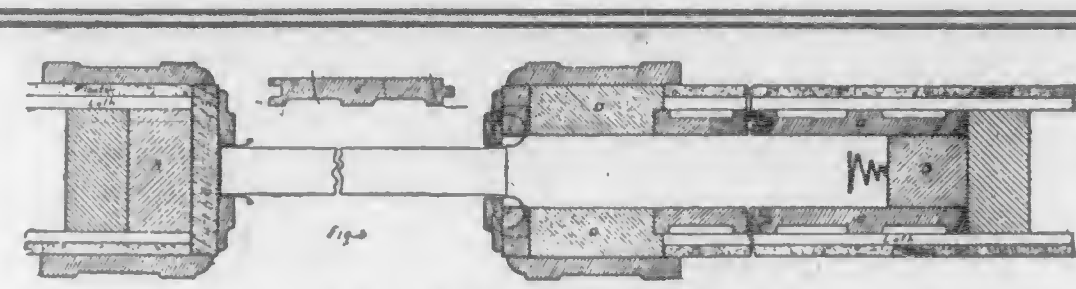
"The test proved, beyond a doubt, that the engine was capable of putting out almost any fire, but on account of a defect in one of the new valves on the hose attachment the flow of the stream was retarded very preceptibly as was demonstrated last evening when excelsior, saturated with kerosene, was again placed in the frame structure built for the test. Into the seething mass of flame the hose was played for three seconds with the result that the flame was smothered by the heavy vapor.

"The feature of the chemical preparation which the L. E. Boyle Company of San Francisco, coast agents, claim as superior over other chemical apparatus is the fact that the vapor caused by the chemical action is heavier than air and as a consequence fire can be fought in the open as the mantle of vapor settles over the flame, smothering it out. Other chemical processes work well in a closed room where the light vapor is confined, but in the open ascend and make little or no resistance to the flames."

Big Laboratory Contract

Word comes from Chicago that Robert W. Hunt & Company, who maintain a branch office at 425 Washington street, San Francisco, have received a contract from the Chicago and Northwestern Railway to inspect materials for the new $2,000,000 terminal station in Chicago. It is said that some 28,000 tons of steel alone will be used in the building. Robert W. Hunt & Co., enjoy an international reputation as experts in their line. Their services are in demand in connection with industrial enterprises in all parts of the world, not only for consultation with engineers and superintendents of railway and industrial plants, builders of machinery, bridges, locomotives, etc., but for actual testing and inspection of materials, chemical analysis and reports on iron and steel manufacturing processes. The value of these services lies in the fact that absolute information is furnished, so that builders and contractors can go ahead with accurate knowledge as the basis of their operation.





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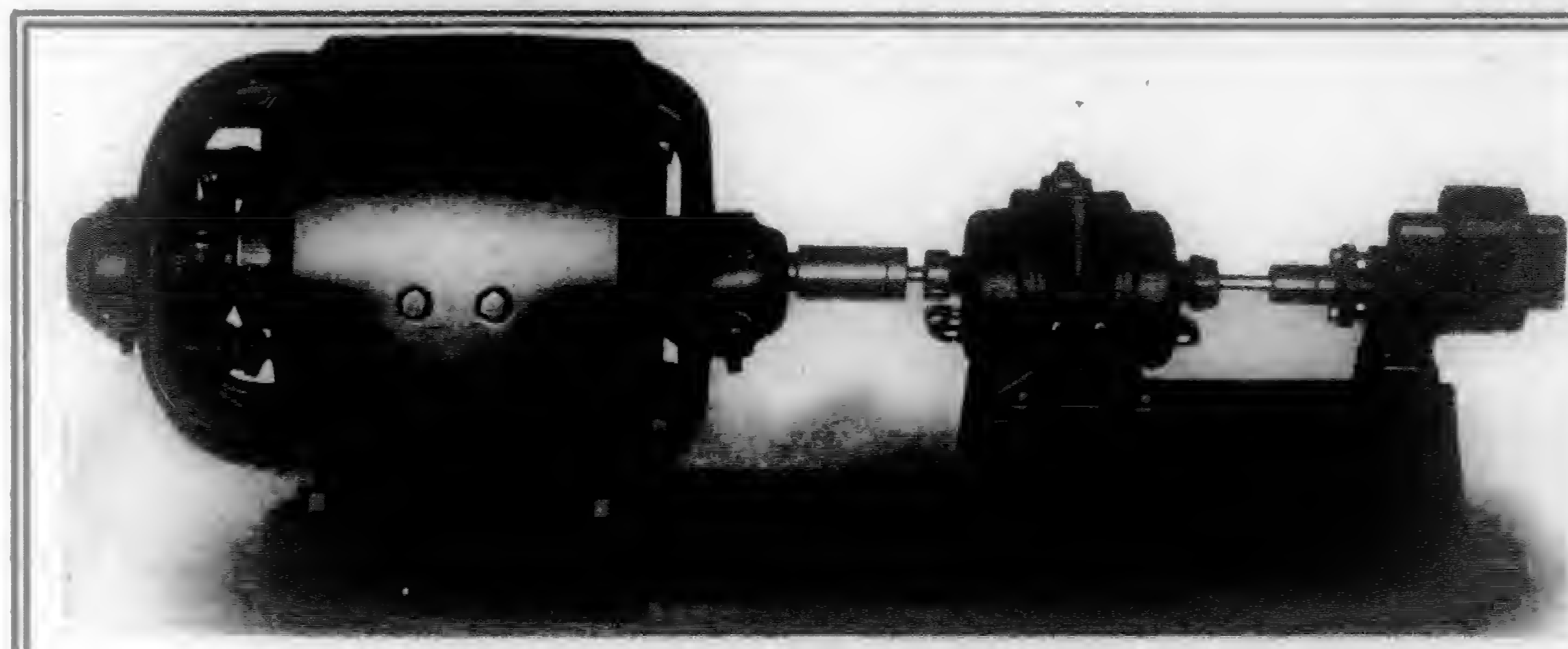
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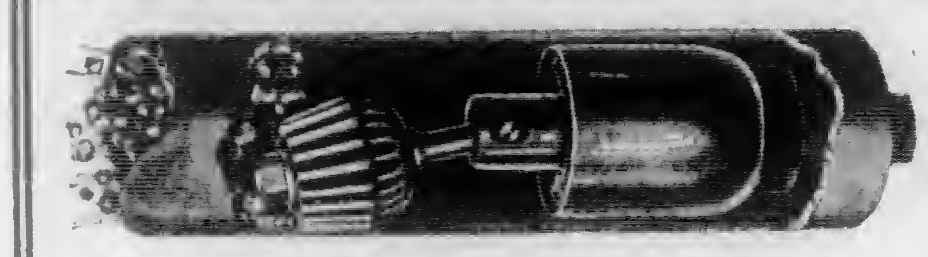
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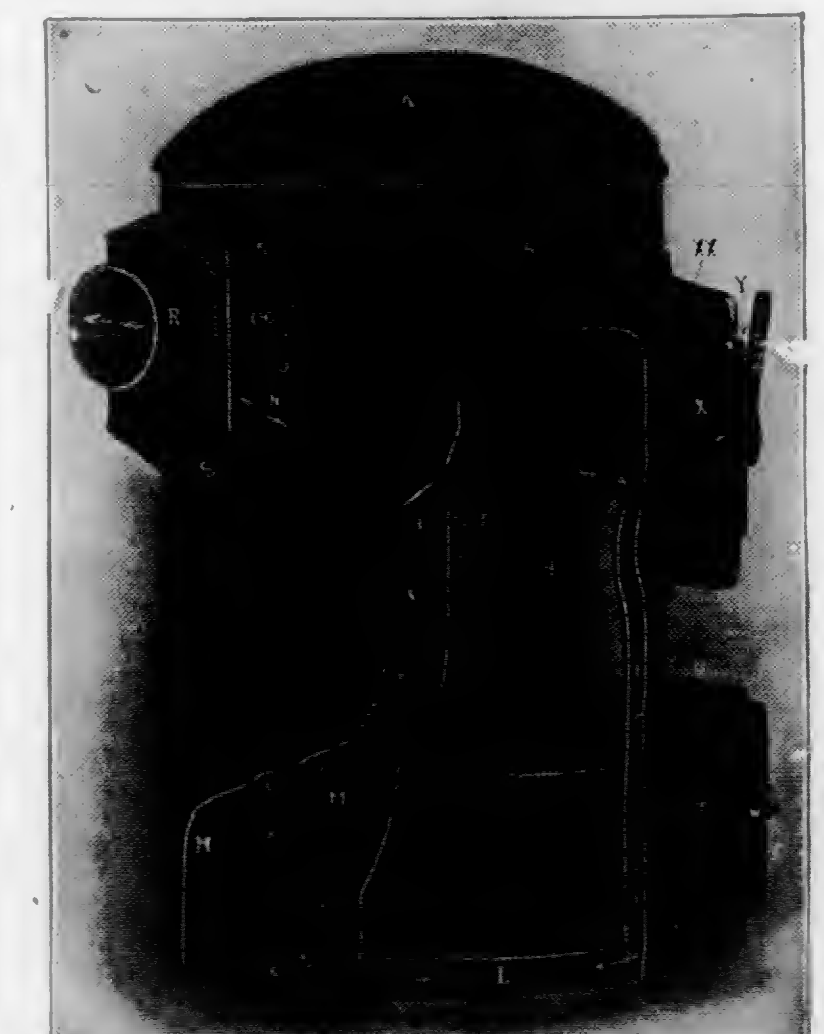
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New School Buildings for Los Angeles

The construction of a number of new school buildings in Los Angeles is scheduled for this year. A list of the proposed buildings has been prepared by the board of education and estimates for each has been calculated. The principal building proposed is that for a new high school. It is to have a capacity for 1500 scholars, and to cost $245,000.

Extensive improvements are also planned for the Polytechnic high school grounds. An additional building to cost $100,000 will be built.

The Chicago Cement Show

All arrangements for the second annual Cement show, in Chicago, have been completed. It will be held in the Coliseum, February 18-24, 1909. A uniform scheme in the arrangement of booths and the decoration of the Coliseum will be employed. This makes it practically unnecessary for the exhibitor to do anything else than to move into the space allotted to him.

The Central Passenger Association has authorized a rate of one and one-half fare for the round trip on the certificate plan from points in its territory and it is also likely that other associations will authorize similar reductions. These reduced rates will no doubt attract a large attendance from out of town.

The Illinois Masons' Supply Association and the Illinois Lumber Dealers' Association have announced that they will hold their conventions in Chicago during the show. This will mean the presence of a great many persons directly interested in the uses and appliances for the use of cement.

Asbestos Covering

Asbestos covering for pipe and boilers, also asbestos paper and mill board are specialties which the Pacific Coast Asbestos Manufacturing Company of Portland, Or., are offering to the building trade. Some large orders are being filled. The Company has its own factory at 1350-52 Macadam street, Portland. The offices are at 210 Columbia street in the same city.

An Index to the Advertisements

[Index continued on Page 100.]

National Brickmakers' Convention

The National Brick Manufacturers' Association has selected Rochester, N. Y., for the next place of meeting. The Twenty-third Annual Convention will be held there, February 1 to 6, 1909.

It is anticipated that reduced railroad rates will be granted as in former years, and in due time full particulars will be announced, together with complete program, and the arrangements for the entertainment of visitors. The latter will be under the auspices of the clay workers of Rochester and vicinity.

The American Ceramic Society will meet Monday, Tuesday and Wednesday forenoon.

The National Paving Brick Manufacturers' Association will meet Monday and Tuesday, the 1st and 2nd, as will also the National Clay Machinery Association. The National Brick Manufacturers' Association sessions will begin Wednesday afternoon at 2:00 o'clock.

Book Review

"Two-Family and Twin Houses," consists of a variety of designs contributed by leading architects in all parts of the country.

In preparing this work the editor has had in mind the large demand on the part of both owner and tenant for the latest and best designed houses suited to the occupancy of two families, or possibly three.

The growth of American towns and villages has been such of late as to advance the price of land within reasonable distance of business centers, making it impossible to supply every family with an isolated dwelling. But at the same time the idea of privacy is so thoroughly fixed in the American mind, that to satisfy the average American family it must be recognized in designing even duplicate dwellings.

A review of these pages will show that this has been thoroughly recognized by the architects whose designs are here presented, and even on very small lot areas the isolation of familes has been preserved.

The designs presented are not from any limited section or from the hands of a few designers, but represent the thoughts of architects who have studied the needs of people in all parts of the country under greatly varied conditions.

Published by William T. Comstock, New York, Price $2.

The Spencer Turbine Vacuum Cleaner

The Spencer Turbine Cleaner, handled by Henshaw, Bulkley & Co., San Francisco, is designed to be installed in the basement of a building with one or more riser pipes going up through the building and an inlet valve on each riser at each floor for a hose to be connected to it. This permits all dust and dirt to be carried down and deposited in the dirt receiving pans in the machine, one being located in the upper part of the machine

to collect the large dirt and litter, and one in the base of the machine to collect the fine dust which goes through the turbine. The foul air and germs resultant from any cleaning by suction are carried to a chimney or sewer by a pipe connected to the exhaust end of the turbine, this being the lower opening shown in the cut. It will be appreciated that this is a far more sanitary method than to exhaust the germ-laden air directly back into the room that is being cleaned. The risers are connected to the machine at the opening shown just beneath the motor.

A most careful investigation on the part of engineers, architects and all others interested in vacuum cleaning apparatus is welcomed by The Spencer Turbine Cleaner Company, and a demonstration may be had at any time at the show rooms of Henshaw, Bulkley & Co. This department is in charge of F. A. Bryant.

The simplicity of the Spencer air turbine is ideal as it has no auxiliary tanks nor complicated pistons and valves. It has only one moving part which touches nothing except the bearings in which it rotates. Obviously it requires but little attention and there is no chance of its getting out of order if the bearings are lubricated properly. Further, the simplicity of the apparatus is so great that skilled and expert attendants are unnecessary.

Test of Burglar Alarm for Wall Safes

The Herring-Hall-Marvin Safe Company recently held a demonstration of a burglar alarm protection provided in connection with wall safes for apartment houses, hotels, etc. A large number of architects and property owners witnessed the tests which were intensely interesting and demonstrated in a most positive manner the value of the invention. The contrivance is exceedingly simple. Any tampering with the safe or combination will immediately sound an alarm on a large gong in the office and an indicator shows the room in which the tampered safe is located.

ADVERTISERS' INDEX—Continued from Page 97

Foundry Work by the Pacific Iron Works

The magnitude of the work undertaken by the foundry department of the Pacific Iron works is not generally understood in Portland, nor in any of the larger cities on the Pacific Coast, for that matter.

Among the orders now being filled by this concern is for 900,000 pounds or 450 tons of cast columns for a new warehouse for Crane & Company.

The use of cast iron in this way is of interest at this time, it being called for by the owners as a result of their experience with similar material in Eastern cities—the price being about the same as steel.

The diameter of the columns for the first story is 15 inches, this being reduced for each story, those for the top story being 10 inches.

The foundry department of the Pacific Iron Works is very much in evidence in the building industry in this part of the United States.

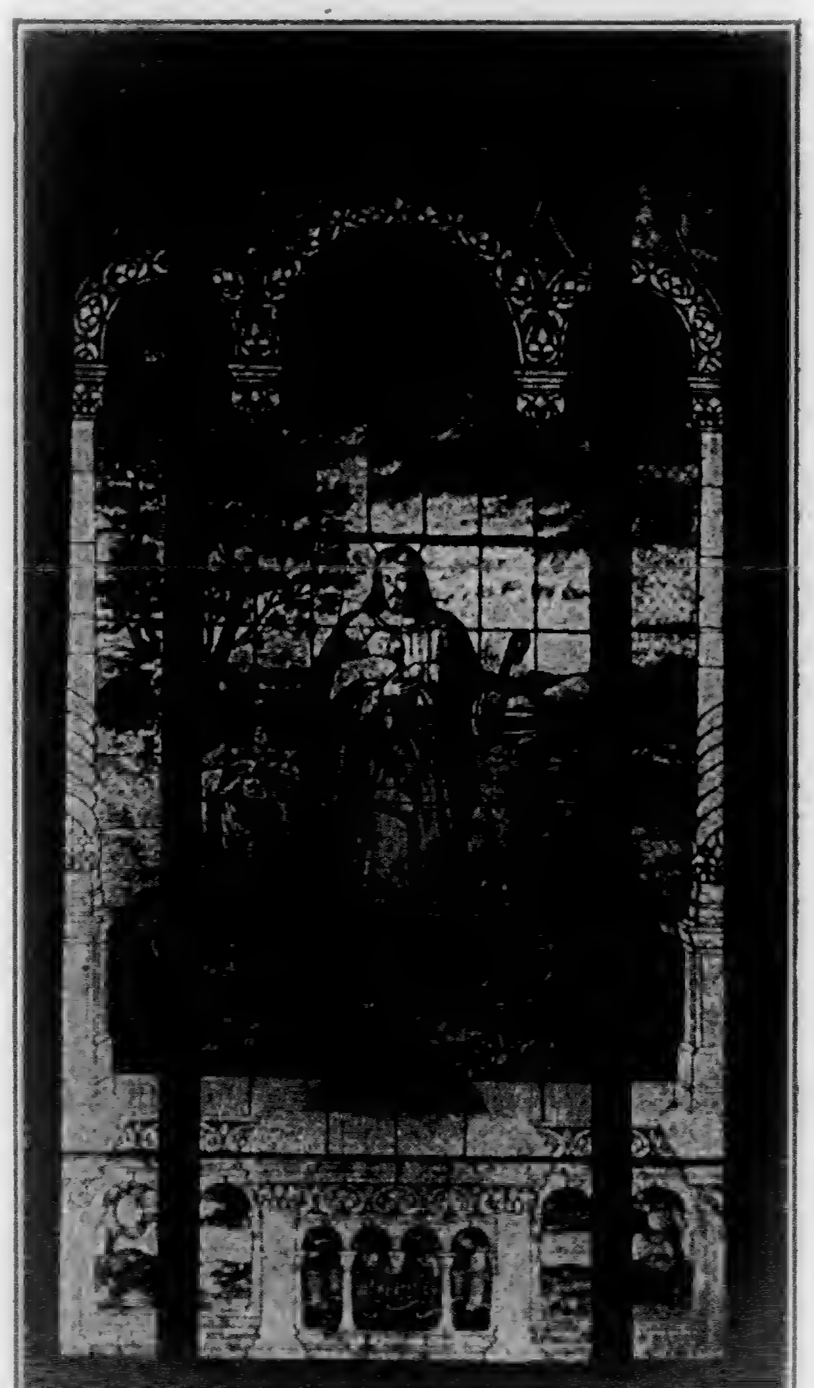
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Hardwood From all Quarters of the Globe

White Bros., the pioneer hardwood lumber dealers in San Francisco, have just issued their annual stock list for January 1st, 1909, which is, indeed, a remarkable document, covering as it does, nearly three million feet of lumber exclusive of veneers, balusters, dowels, lignumvitae and rosewood. The figures given would seem to bear out the firms claim that they have the largest stock of hardwoods west of Chicago. The great variety of woods carried shows the wide diversity of the stock.

White Bros., draw their material from all parts of the world. The Mississippi Valley furnishes them with the American hardwoods such as ash, oak, hickory, etc., while the region of the Great Lakes furnishes the birch and maple. From Australia comes ironbark, carra bean and red bean, all species of the eucalyptus. The East Indies furnish camphorwood, while Siam and Burmah provide teak. Koa comes from the Hawaiian Islands; lignumvitae, mahogany, Spanish cedar, and Jenisero from Mexico, and circassian walnut from the shores of the Mediterranean and boxwood from the Levant. It may well be said that all the world contributes to the upbuilding of San Francisco.

White Ornamental Iron Company

The rebuilding of San Francisco has created a big market for ornamental iron, bronze and metal goods. A firm that has been getting its share of this class of work and which, in consequence, has found it necessary to expand, is the White Ornamental Iron Company of Oakland. From modest quarters the company has moved to one of the largest shops of the kind on the coast. The buildings, for there are several of them, occupy several hundred feet of water front at the foot of Fifth avenue, East Oakland. The location is an excellent one from the standpoint of transportation facilities, having Southern Pacific spur tracks in close proximity besides a fine wharf and good shipping facilities to San Francisco.

The several buildings of the company are well planned and should prove amply large to accommodate a steadily increasing business for a number of years to come. The plant includes a grille and ornamental iron shop, 100 by 150 feet; plating department, 50 by 40 feet and containing three eighteen-foot tanks for plating bronze, copper and brass; pattern shop and foundry, the latter being 70 by 110 feet.

Witt Company in New Quarters

The G. E. Witt Company, makers of modern oil-burning plants and machinery, has outgrown the old stand at 1165 Howard street, San Francisco, and has moved to larger and more central quarters at 850-52 Howard street. The new location gives the company plenty of light and an abundance of room, two features which were badly needed in the old building. Mr. Witt has just published a new catalogue describing the several kinds of oil-burning plants made by the company, and a copy will be sent free to readers of this magazine upon application

New Year Starts Well

The new year opened well for Ahlbach and Mayer, 75 Dorland street, San Francisco. This plumbing house enjoyed a most successful year in 1908, and the prospects for 1909 are, indeed, bright. Among the buildings for which they did the plumbing the past year are the following:

Seven-story brick building on Market street, near Seventh, Macdonald & Applegarth, architects; two-story brick building on Market street, near Larkin, and designed by Price & Hutchinson; five-story brick Chinese Mission on Portsmouth Square, Francis W. Reed, architect; two-story and basement flat building on Hayes street, Welsh & Carey, architects; three-story and basement apartments, Mason near Sacramento street, W. W. Rednall, designer and builder; and a three-story and basement brick building on Kearny street, between Sacramento and California, Wm. Mooser, architect.

The Portland Wire & Iron Works

The past year has been the most important in the history of this company, which is the largest in its line in the Northwest, its business extending not only well over Oregon, Washington, Idaho, Western Montana and Wyoming, but to British Columbia and Alaska as well.

The company has just equipped the entire public school system of Spokane with a superior design of fire escapes. The award was made only after the school board of that city and the engineers employed by them had instituted a most careful inquiry into the standing of the Portland company and the quality of its product.

Among the contracts on which they are now at work are the Kiernan building, Blaumaur & Frank building, Crawford building, Rosenthal building, the Meier & Frank building, the Good Samaritan Hospital and The Y. M. C. A. building, which they will equip with elevator enclosures, metal stairways, metal stair and balcony railings and very complete metal fire escapes.



Filing Equipment Installed by the Library Bureau in the Office of John Galen Howard, Architect

A Catalogue Filing System--or "Filing Catalogues"

CONSIDERABLE discussion, pro and con, has appeared in recent numbers of the Architect and Engineer regarding the "catalogue nuisance," notably Mr. Wallingford's article in the July issue, and Mr. Requa's in the September number. The question of the convenient and "instantly at hand" filing of the catalogues continually received in the offices of architects, engineers and contractors, and the proper care of the great number of plans, specifications and blue prints handled, is one of vital interest and great importance to the profession and trade generally.

The crying need of some method or device that will overcome present difficulties is strongly felt by those who have occasion to keep at hand catalogues and who constantly handle plans, etc. Mr. Requa, in the above mentioned article, has happily described the solving of his troubles and has blazed the way for others by telling of the use of a vertical filing system, capable of indefinite extension.

Herewith are shown photographs of the catalogue and filing departments installed by the Library Bureau, 674-678 Mission street, San Francisco, in the offices of Architect John Galen Howard, San Francisco. The upper cut shows index and filing system for catalogues and price lists. The lower shows index and filing system for plans, specifications, blue prints, contracts and correspondence.

The catalogues are indexed by means of cards bearing names and addresses of manufacturers, together with the number by which catalogue can be instantly referred to in the vertical cabinet. As a cross reference a second card is written, bearing the name and class of goods, the name and address of manufacturer, and the reference number in filing cabinet. Both card indexes are arranged alphabetically. Correspondence, plans, specifications and blue prints are cross indexed similar to above and are instantly at hand, whether by name or subject matter.

The vertical files are carried in three sizes by the manufacturer for catalogue filing, to accommodate catalogues 8x10 inches, 10x12 inches and 12x15 inches. Catalogues are numbered for filing from No. 1 up, with the prefix "A," "B," or "C," according to size as above, placed in manila holders, and arranged numerically in the vertical file drawers. The same system of filing applies to correspondence, plans and specifications, etc.

Too much system is not used, for the whole operation is simple and easily kept up, and makes impossible the heterogeneous collection of catalogues which must be searched through and through for information, as this system provides subject and article index as well as manufacturer's name.

To quote Mr. Requa's previously mentioned letter, "No investment that has been made in this office has brought such large and quick returns in saving of time, labor and disposition, as has this vertical catalogue filing system."

The Oregon Engineering Company.

The Oregon Engineering Company is a corporation composed of men with long experience in electerical and mechanical engineering and contracting.

Mr. Amme, the president of this company, is a leading Portland electrical contractor, installing electric power plants, wiring large business buildings, etc., and will be remembered as the man who had in hand all the Portland World's Fair electric work.

Mr. Beardsworth, the secretary, and a graduate of Case School of Applied Science of Cleveland, Ohio, 14 years experience in designing, building and installing electrical machinery, has built many large plants both in the east and on the Pacific coast.

Mr. Anthony Hower, the vice-president and superintendent is a mechanical expert with twenty years experience in erecting and operating mechanical and electrical installations.

With this personnel at the head of this organization, we feel confident that they can take good care of any and all work that may be placed with them and give entire satisfaction in every way. The electrical work on the Beck building, Seventh and Oak streets, Portland, now completed, is a monument to the skill of these engineers and well merits all the approval that the owners have bestowed.

This company is prepared to handle any electrical installation, large or small, either as engineers or contractors.



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(See Description Above.)

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In order to serve employers more promptly and effectively, the University of California has established a special registry for its graduates who are seeking positions. Chemists, engineers, architects, draughtsmen, surveyors, etc., are now registered by the appointment secretary, who secures evidence in regard to each man's qualifications, and who is prepared to furnish this information to employers at any time. Business houses may be supplied with men for almost any line of work, the College of Commerce furnishing men especially fitted for taking up mercantile work. The College of Mining sends out men trained for work as mining engineers, assayers and prospectors. Address Appointment Secretary, 203 California Hall, Berkeley, California.

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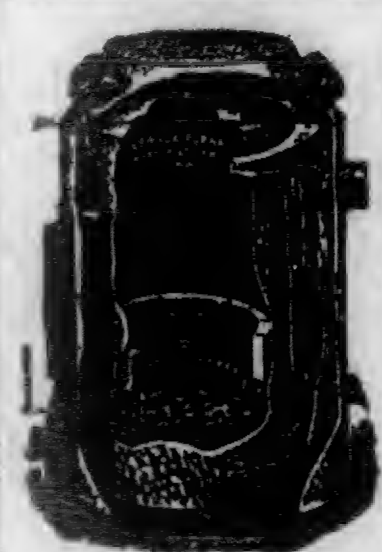
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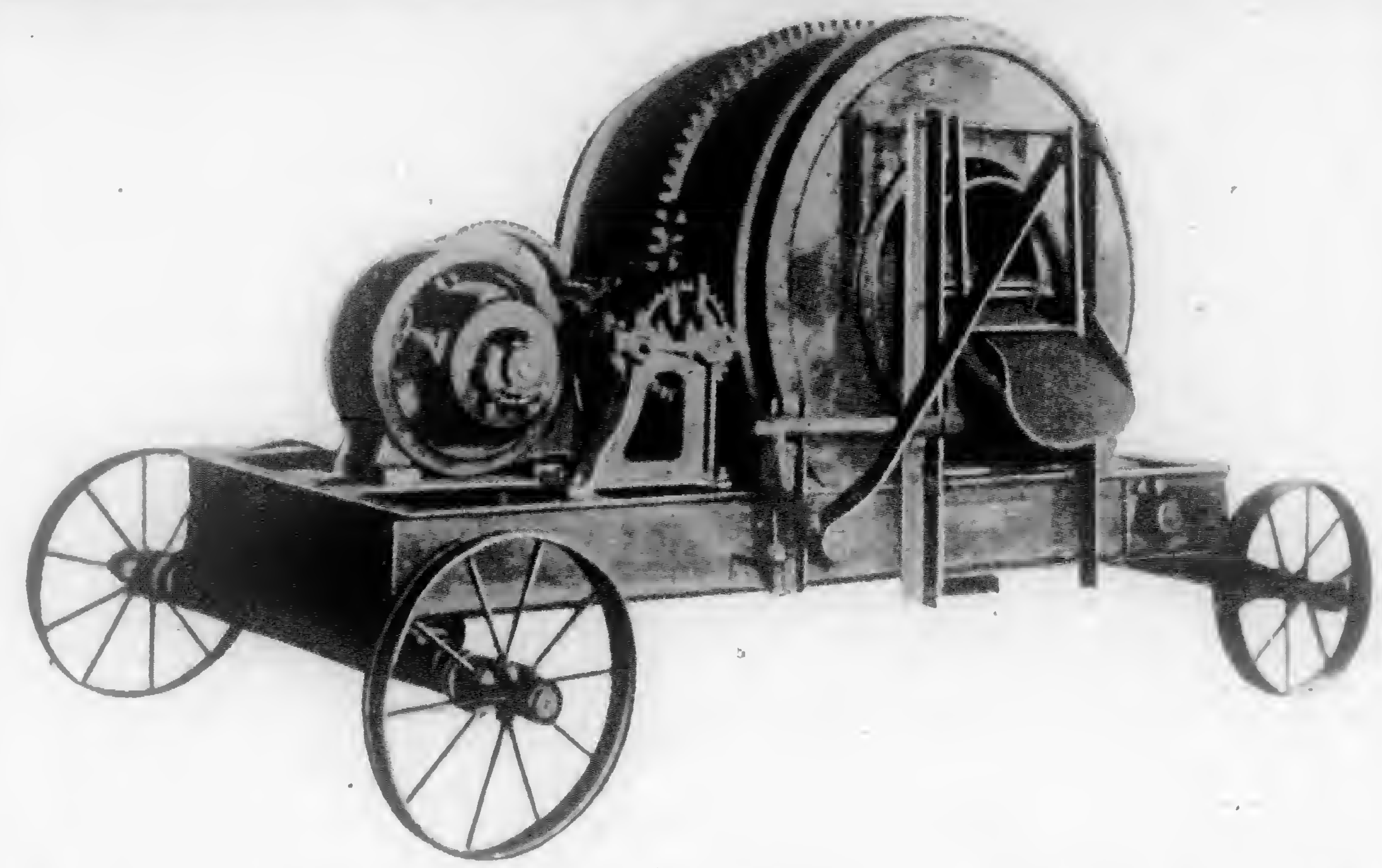
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ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see page 105)

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Carnegie Brick and Pottery Co.,
Clunie Bldg., Montg'y and Calif. Sts., S. F.
Gladding, McBean Co.,
Crocker Bldg., S. F.
The Pyrmont Brick Co.,
Second and Clay Sts., Oakland
Golden Gate Brick Co..660 Market St., S. F.
Los Angeles Pressed Brick Co.,
1006 Union Trust Bldg., Los Angeles
N. Clark & Son ......17 Spear St., S. F.
Steiger Terra Cotta & Pottery Co.,
Mills Bldg., S. F.



ARCHITECTS' SPECIFICATION INDEX—*Continued*

BRICK AND TERRA COTTA—Continued
Pacific Face Brick Co.,
401 Commercial Club Bldg., Portland.
California Brick Co. and Stockton Brick Co., represented by United Materials Co., Balboa Bldg., S. F.
Remillard Brick Co..108 Bacon Block, Oakland

BRICK MASONS
McGowan & Butler 332 Builders' Ex., S. F.
Chas. H. Hock..910 B Devisadero St., S. F.
Moore & Hardin,
610 Washington St., Vancouver, Wash.
McWhirter & Drake,
Builders' Exchange, S. F.

BRICK TILE
American Encaustic Tiling Co., Ltd.,
Monadnock Bldg., S. F.

BRICK AND TILE CONTRACTOR—
James Lucas......1884 McAllister St., S. F.

BUILDERS' HARDWARE
Russell & Erwin Mfg. Co.,
933 Monadnock Bldg., S. F.
The Ross Co.......87 Grand Ave., Portland
United Builders' Supply Co.,
687 Mission St., S. F.

BUILDERS' SUPPLIES
M. J. McCraken Co...231 Pine St., Portland
Albert J. Capron,
Ainsworth Bldg., Portland, Ore.
Willkomm Building Supply Co.,
151 Tehama St., S. F.
Waterhouse & Price......59 Third St., S. F.

BUILDING LOANS—
R. N. Burgess & Co.,
1 Telegraph Ave., Oakland
Hansbrough & Yorston,
Metropolis Bank Bldg., S. F.

BURLAPS, CANVASES, ETC.
Richter Mfg. Co.,
2 Franklin Ave., Tenafly, N. J.

CAPITALS, MOULDINGS, ETC.
Western Builders' Supply Co.,
680 Mission St., S. F.

CARBONIZING COATING
McCormick & Henderson,
Postal Telegraph Bldg., S. F.

CASTINGS
Steiger & Kerr Co..Folsom and 18th Sts., S. F.

CEMENT
Pacific Portland Cement Co.,
Pacific Bldg., S. F.
Western Building Material Co.,
430 California St., S. F.
The Building Material Co., "White Portland,"
587 Monadnock Bldg., S. F.
Holmes Lime Co.,
Mutual Savings Bank Bldg., S. F.
Kerr, Gifford & Co.,
Concord Bldg., Portland, Ore.
Pacific Builders' Supply Co.,
207 Builder's Ex. Bldg., S. F.
Geo. B. Rate & Co.
182 Madison St., Portland, Ore.
Standard Portland Cement Corporation,
Crocker Bldg., S. F.

CEMENT TESTS
Robert W. Hunt & Co.,
425 Washington St., S. F.

CEMENT AND CONCRETE AND BRICK BLOCKS
Ideal Concrete Construction Co.,
102 Grand Ave., Portland Ore.

CEMENT EXTERIOR FINISH
Medusa White Portland Cement, California Agents, The Building Material Co., Inc.,
587 Monadnock Bldg., S. F.

CEMENT AND PLASTER CONTRACTORS
Callahan & Manetta....344 Tenth St., S. F.
D. Ross Clarke......708 Pacific Bldg., S. F.
Alta Title Co........Pacific Building, S. F.
W. N. Whitmore,
3203 E. 17th St., Fruitvale, Cal.
V. W. Mason................St. Johns, Ore.

CHEMICAL ENGINEERS
Robert W. Hunt & Co.,
425 Washington St., S. F.

CHIMNEY BUILDERS
Dunlevy & Gettle....79 City Hall Ave., S. F.
Dresser, McDonnell & Co.,
39-49 Isis St., S. F.

CHURCH FURNITURE
Whitaker & Ray Co....141 Grove St., S. F.
Spencer Desk Co....Monadnock Bldg., S. F.
C. F. Weber & Co......1151 Polk St., S. F.

CONCRETE CONSTRUCTION
Bluxome & Co.........5 Front St., S. F.
H. L. Petersen............62 Post St., S. F.
Northwest Bridge Works,
Fifteenth and Front Sts., Portland

CONCRETE HOISTS
The Wallace-Lindesmith Hoist Co., San Francisco, Los Angeles, Portland, Seattle

CONCRETE MIXERS
F. T. Crowe & Co.,
Seattle, Tacoma, Spokane and Portland
Municipal Engineering and Contracting Co.,
789 Folsom St., S. F.

CONCRETE MIXERS AND BLOCK MACHINES
Chas. F. Beebe Co., Agents Smith Concrete Mixers. ....Portland, Ore.
Chicago Improved Cube Mixer,
Pacific Coast Offices, 789 Folsom St., S. F. and F. T. Crowe & Co., Portland and Seattle
Wallace, Lindesmith, Hoist Co.,
San Francisco, Los Angeles, Portland and Seattle.

CONCRETE REINFORCEMENT
Lilley & Thurston Co.....82 Second St., S. F.
International Fabric & Cable, represented by Western Builders' Supply Co.,
680 Mission St., S. F.

CONTRACTORS, GENERAL
Continental Fireproofing Co.,
Mutual Savings Bank Bldg., S. F.
Laughland & Schnebly Co.,
1443 Broadway, Oakland
Lange & Bergstrom,
138 Investors' Bldg., S. F.
Ransome Concrete Co....Crocker Bldg., S. F.
Hoyt Bros.,
Builders' Exchange, S. F., and Santa Rosa
Healy-Tibbitts Construction Co.,
106-11 Hansford Block, S. F.
Litherland & Abrey.229 Beck Bldg., Portland
W. McKenzie ....734 Washington St., S. F.
Peter Randolph Co.,
622 Chronicle Bldg., S. F.
Northwest Bridge Works,
Fifteenth and Front Sts., Portland
Irwin Bros.........3618 Sixteenth St., S. F.
Redmond, De Luca & Barzellotti,
628 Montgomery St., S. F.
C. P. Moore Building Co.,
703 Mills Bldg., S. F.
Hansbrough & Yorston,
716 Metropolitan Bank Bldg., S. F.
Smith & Watson Co.....323 Lick Bldg., S. F.
Gutleben Bros..944 Monadnock Bldg., S. F.
Stewart & Ratliff,
2407 Santa Clara Ave., Alameda, Cal.
Keystone Construction Co.,
417 Montgomery St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Corwin & Dare..........Lick Bldg., S. F.
Webster-Mace Construction Co.,
Merchants' Exchange Bldg., S. F.
S. F. Rebuilding Co......Pacific Bldg., S. F.
Warren Construction Co.,
217 Beck Bldg., Portland, Ore.
E. D. Crowley Co.,
127 Montgomery St., S. F.
Chas. King & Co...........Lick Bldg., S. F.
J. & H. E. Sullivan,
2070 University Ave., Berkeley
Lucas, James......1884 McAllister St., S. F.
Rickon-Ehrhart Eng. & Const. Co.,
1859 Geary St., S. F.

CORKBOARD INSULATION
Armstrong Cork Co....693 Mission St., S. F.

CORNICES
Chas. S. Amsler.......25 Shotwell St., S. F.
W. Heidt Cornice Works..152 First St., S. F.

DAMP-PROOFING COMPOUND
Hydrex Damp Proof Paint, sold by L. E. Boyle Co., Inc........100 Front St., S. F.
H. D. Samuel Company..23 Valencia St., S. F.
Winslow's Hydrolithic Coating, Willkomm Supply Co., 151 Tehama St., S. F.

DOOR OPENER
G. Rischmuller..........Builders' Ex., S. F. and 842 37th St., Oakland

DOOR HANGERS
Reliance Hangers ....(see page 104)
Pitcher's Hanger—The Pacific Tank Co.,
318 Market St., S. F.
"John's Hanger," sold by San Francisco Hardware Co.,....3069 Sixteenth St., S. F.

DOORS—METAL
California Fireproof Door Co.,
1932 So. Main St., Los Angeles
Fred Nichols....1137 Sixteenth St., Oakland
Portland Sheet Metal Works,
E. 7th and E. Madison Sts., Portland
Waterhouse & Price.......59 Third St., S. F.

DOORS—VENEER
Northwest Door Co., Albina Ave., Portland

DRILLS, BRICK AND STONE
Star Expansion Bolt Co..61 Second St., S. F.

DUMB WAITERS
Wells & Spencer Machine Co.,
139-141 Beale St., S. F.

ELECTRICAL CONTRACTORS
California Elec. Construction Co.,
680 Mission St., S. F.
Central Electric Co..185 Stevenson St., S. F.
C. K. Claggett....66 Park St., Portland, Ore.
Hanbridge-Loyst Electric Co.,
564 Eddy St., S. F.
Butte Engineering Co...683 Howard St., S. F.
Enterprise Electric Works,
118 Eighth St., S. F.
Steger Electrical Works.........Fresno, Cal.
Comet Electric Co............Portland, Ore.
A. C. Thode............860 Waller St., S. F.
Western Electric Works,
61 6th St., Portland, Or.

ELECTRICAL SUPPLIES
Geo. C. Fenton....307 Williams Bldg., S. F.

ELEVATORS
Van Emon Elevator Co.,
54 Natoma St., S. F.

ELEVATORS—Continued
Western Elevator Co.,
801 Humboldt Bank Bldg., S. F.
Otis Elevator Company,
Stockton and North Point, S. F.
Wells & Spencer Machine Co.,
139 Beale St., S. F.
Hammond Elevator Co.,
Seventh and King Sts., S. F.
Pacific Electric Engineering Co.,
213 Second St., Portland, Ore.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
W. W. Breite...........Clunie Bldg., S. F.
W. E. Leland..Merchants' Exc. Bldg., S. F.
Cox & Vengelen......229 Pine St., Portland
Charles List.......211 Williams Bldg., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FILTERS
American Filter Co..16 California St., S. F.

FIRE ESCAPES
Standard Iron Works.........Portland, Ore.
Burnett Iron Works............Fresno, Cal.

FIRE EXTINGUISHERS
Goodyear Rubber Company,
587-591 Market St., S. F.

FIREPROOFING
Gladding, McBean & Co.,
311 Crocker Bldg., S. F.
Continental Fireproofing Co.,
908 Mutual Bank Building, S. F.
Roebling Const'n Co...Crocker Bldg., S. F.
San Francisco Fireproofing Company, Collins system.........Metropolis Bank Bldg., S. F.
Healy-Tibbitts Co.......Hansford Bldg., S. F.
Nat'l Fireproofing Co. Monadnock Bldg., S. F.

FIREPROOF FLOORING
Raecolith Company.....71 First St., Portland
61 Yesler way, Seattle
207 Builders' Ex., S. F.
Demolith Fireproof Flooring Company,
417 Montgomery St., S. F.

FIRE DOOR HANGERS
California Fireproof Door Co.,
1932 S. Main St., L. A.

FIREPROOF SHUTTERS AND DOORS
Jas. G. Wilson Mfg. Co.,
3 W. 29th St., New York, and
McCormick-Henderson Co.,
Postal Telegraph Bldg., S. F.

FIRE PROTECTION
Goodyear Rubber Company,
587-591 Market St., S. F.

FLOOR POLISH
Butcher's Boston Polish Co.,
356 Atlantic Ave., Boston, Mass.

FLOORING—ENGLISH BLOCK FLOOR
Jas. G. Wilson Mfg. Co.,
3 W. 29th St., New York, and
McCormick-Henderson Co.,
Postal Telegraph Bldg., S. F.

GAS FURNACES
Gas and Electric Appliance Co.,
914 O'Farrell St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

GENERAL INSPECTION
Western Inspection Bureau,
621 Monadnock Bldg., S. F.

GLASS—PRISM, ART, ETC.
San Francisco Art Glass...Mission St., S. F.
Cal. Art Glass Works..938 Howard St., S. F.
United Glass Co.........115 Turk St., S. F.
Munich Art Glass Co.....510 Turk St., S. F.
Povey Bros. Glass Co.,
Fifth and Flanders Sts., Portland

GRAVEL AND CRUSHED ROCK
Chas. P. Nott, ..379 Alma St., Palo Alto, Cal.
John Cassaretto......245 Berry St., S. F.
Kruttschnitt Building Material Co.,
Pacific Bldg., S. F.

HARDWOOD LUMBER
E. A. Howard Co.......20 Howard St., S. F.
King-Brown Co.,
First St., bet. Wash'n & Clay, Oakland
White Brothers,
Cor. Spear and Howard Sts., S. F.
Dieckman Hardwood Co..Welch Bldg., S. F.

HARD WALL PLASTER
Marbleite Hardwall Plaster, sold by Western Building Material Co.,
340 Steuart St., S. F.
Adamant Co.. Worcester Bldg., Portland

HEATING AND VENTILATING
California Hydraulic Eng. & Supply Co.,
523 Market St., S. F.
Henshaw, Bulkley & Co.,
19, 21 Fremont St., S. F.
Burness & Martin.129 Sixteenth St., Portland
A. W. Curry.......116 Grand Ave., Portland
T. C. Thronson,
415 Hawthorne Ave., Portland
Thos. E. Hulme & Co.,
275 Fifth St., Portland
C. L. Johnson & Co.,
285 Grand Ave., Portland
Gardner & Kendall Heating Co.,
40-42 Second St., Portland, Ore.
Jordan Flue Block Co........Ashland, Ore.
Machinery and Electrical Co.,
351-353 N. Main St., Los Angeles
Solar Heater Co.,
333 New High St., Los Angeles
Mangrum & Otter, Inc..507 Mission St., S. F.
Pacific Blower & Heater Co.,
3261 17th St., S. F.
Gilley-Schmid Co., Inc.,
13th and Mission Sts., S. F.
United Builders' Supply Co.,
687 Mission St., S. F.

HEATING ENGINEERS
Cox & Vengelen..229 Pine St., Portland, Ore.
W. E. Leland....Merchants Ex. Bldg., S. F.

HINGES
Stanley's Ball Bearing Hinges, Stanley Co.,
New Britain, Conn.

IMITATION STONE
O. Barbi..........612 Washington St., S. F.
Ideal Concrete Construction Co.,
102 Grand ave., Portland, Or.

INSURANCE
Pacific Surety Co..326 Montgomery St., S. F.
Voss, Conrad & Co...Monadnock Bldg., S. F.
Standard Marine Ins. Co.,
Montgomery and Sacramento Sts., S. F.

INTERIOR DECORATING
L. Tozer & Son Co...........Pine St., S. F.
Schastey & Vollmer, 1930 Van Ness Ave., S. F.
W. W. Tucker,
14th and Webster Sts., Oakland
C. E. Gordon..........1235 Pierce St., S. F.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
425 Washington St., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
680 Mission St., S. F.

LAUNDRY MACHINERY
Western Laundry Machinery Co.,
58-60 Fremont St., S. F.

LAUNDRY TRAYS
Gladding, McBean & Co.,
311 Crocker Bldg., S. F.
J. F. Reilly & Co.....23 Spencer Place, S. F.
Peerless Mfg. Co.....364 Eleventh St., S. F.

LIGHTING FIXTURES
Barrett's Lighting Fixtures,
408 Morrison St., Portland Ore.
The Enos Company..1748 California St., S. F
Adams & Hollopeter....745 Mission St., S. F.
Welsbach Co.......351 McAllister St., S. F.
Morrison Electric Co.,
291 Morrison St., Portland

LIME
Holmes Lime Co.....Mutual Bank Bldg., S. F.

LUMBER
Redwood Manufacturers Co.,
453 Bryant St., S. F. 57th St., Oakland
E. K. Wood Lumber Company,
Santa Marina Bldg., 112 Market St., S. F.
Oregon Planing Mills,
Nineteenth and Vaughn Sts., Portland, Or.
S. H. Harmon Lumber Company,
Fifth and Bryant Sts., S. F.
Santa Fe Lumber Co.,
17th & De Haro Sts., S. F.

MACHINERY AND MACHINERY SUPPLIES
Henshaw, Bulkley & Co.,
19-21 Fremont St., S. F.
California Hydraulic Eng. & Supply Co.,
523 Market St., S. F.
Machinery and Electrical Co.,
351 N. Main St., Los Angeles
Eby Machinery Co.....Hansford Bldg., S. F.
Steiger & Kerr Stove & Foundry Co.,
Folsom and 18th Sts., S. F.

MARBLE
Italian & American Marble Works,
16th and Carolina Sts., S. F.
Calif. Peerless Stone and Tile Co.,
Foxcroft Building
Baxter Marble Co...........Call Bldg., S. F.
Columbia Marble Co., 268 Market St., S. F.
Pacific Marble Works,
14th and Shotwell Sts., S. F.

MATTING RUBBER AND TILING RUBBER
Goodyear Rubber Company,
587-591 Market St., S. F.

METAL CEILINGS
Fogle & Mauer Co., representing Canton Art Metal Co...532 Monadnock Bldg., S. F.
San Francisco Metal Stamping & Corrugating Co.........296 Eleventh St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL CEILINGS—Continued
- Western Art Metal and Iron Co., 405 Sixth St., S. F.

METAL AND STEEL LATH
- "All United Steel Studding," Lilley & Thurston Co...82 Second St., S. F.

METAL SHINGLES
- San Francisco Metal Stamping & Corrugating Co........296 Eleventh St., S. F.
- Meurer Bros., rep. by J. A. McDonald, Builders' Exchange Bldg., S. F.
- W. Heidt Cornice Works..152 First St., S. F.
- Portland Sheet Metal Works, E. 7th and E. Madison Sts., Portland, Ore.

METAL WEATHER STRIPS
- Williams & Carter Co...197 Jessie St., S. F.

METAL DOORS AND WINDOWS
- Waterhouse & Price......59 Third St., S. F.
- Portland Sheet Metal Works, Portland, Ore.

MOTORS, GENERATORS, ETC.
- Engineering & Maintenance Co., 195 Fremont St., S. F.
- Western Electric Works, 61 Sixth St., Portland

MORTAR STAINS
- Western Builders' Supply Co., Representing Clinton Metallic Paint Co., Clinton, N. Y.

OFFICE BUILDING DIRECTORIES
- McCormick & Henderson, Postal Telegraph Bldg., S. F.

OIL BURNERS
- G. E. Witt Co.........850 Howard St., S. F.
- S. T. Johnson Co......1334 Mission St., S. F.
- Bennett's Petroleum Burner Co., 579 Howard St., S. F.
- William Ernst..........203 Main St., S. F.
- California Oil Burner Co., 717 Market St., S. F.

OIL—CRUDE FUEL
- Associated Oil Co...Wells, Fargo Bldg., S. F.

OPERA CHAIRS—
- Spencer Desk Co....Monadnock Bldg., S. F.
- Whitaker & Ray Co....141 Grove St., S. F.

ORNAMENTAL CEMENT WORK, CAPITALS AND BRACKETS
- D. Ross Clarke....Builders' Exchange, S. F.
- Western Builders' Supply Co., 680 Mission St., S. F.

ORIENTAL GOODS
- Sing Fat Co., Dupont and California Sts., S. F.
- Sing Chong Co., 601 Dupont St., cor. California, S. F.

ORNAMENTAL IRON AND BRONZE
- G. Lissem............1047 Folsom St., S. F.
- Chr. Deterding......67 Clementina St., S. F.
- White Ornamental Iron Co., 499 Monadnock Bldg., S. F.
- Western Builders' Supply Co., Representing The L. Schreiber & Sons Co., Cincinnati.
- J. G. Braun.........Chicago and New York
- Sartorius Co., Inc...15th and Utah Sts., S. F.
- Rudgear-Merle Ornamental Iron & Bronze Co.....Bay and Stockton Sts., S. F.
- Wagner Ornamental Iron Works, 473 Sixth St., S. F.

PAINT FOR CEMENT
- BAY STATE BRICK AND CEMENT COATING.—Made by Wadsworth, Howland & Co. (Inc.). See adv. in this issue for Pacific Coast agents.

PAINTS, OILS, VARNISHES, ETC.
- Bass-Heuter Paint Co., 818 Mission, near Fourth St., S. F.
- Clinton Metallic Paint Co., Clinton, N. Y., Pacific Coast Agents, Western Builders' Supply Co., 680 Mission St., S. F.
- Paraffine Paint Co., Merchants Exchange Bldg., S. F.
- Oregon Paint & Varnish Co., 93 Grand Ave., Portland, Ore.
- Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and L. A.

PHOTOGRAPHY
- R. J. Waters Co.......717 Market St., S. F.

PLASTERERS
- A. J. Houch & Son, 431 E. Harrison st., Portland, Ore.
- D. Ross Clark....708 Pacific Building, S. F.
- Jas. P. Sexton, .1733 Chestnut St., Oakland

PLUMBING
- Henry F. Maddern, 1169 Jefferson St., Oakland
- Ahlbach & Mayer......75 Dorland St., S. F.
- Fox & Co.......209 Second St., Portland
- M. L. Kline... ....84 Front St., Portland
- Taylor & Stanton......308 Pine St., Portland
- Thos. E. Hulme......275 Fifth St., Portland
- The Gauld Co...9 North Front St., Portland
- J. F. Shea. Second and Ankeny Sts., Portland
- Ryan Bros., 540 Williams ave., Portland, Ore.

PUMPING MACHINERY
- California Hydraulic Eng. & Supply Co., 523 Market St., S. F.

RAILROADS
- Corvallis & Eastern Ry........Portland, Ore.

ROOFING AND ROOFING MATERIALS
- Asbestos Roofing, H. W. Johns-Manville Co...................180 Second St., S. F.
- Mackenzie Roof Co., 427 Fifteenth St., Oakland
- The Watson Roof Co., French Bank Bldg., 110 Sutter St., S. F.
- Western Builders' Supply Co., 680 Mission St., S. F
- Paraffine Paint Co., Merchants' Exchange Bldg., S. F.
- H. D. Samuel Company..23 Valencia St., S. F.
- Olympic Roofing Co., Red Diamond Brand, 420 Sweetland Bldg., Portland
- Eagle Roofing Co., Metropolis Bank Bldg., S. F.
- Ford & Malott, Mariposa and Iowa Sts., S. F.

ROLLING DOORS AND SHUTTERS
- Lilley & Thurston Co.....82 Second St., S. F.
- Louis R. Bidell..720 Broadway, Los Angeles
- Jas. G. Wilson Mfg. Co..3 W. 29th St., N. Y.
- McCormick-Henderson Co., Postal Telegraph Bldg., S. F.

ROLLING PARTITIONS
- Jas. G. Wilson Mfg. Co., 3 W. 29th St., New York, and
- McCormick-Henderson Co., Postal Telegraph Bldg., S. F.

RUBBER STAMPS, ETC.
- Patrick & Co............126 Bush St., S. F.

RUBBER TILING
- Goodyear Rubber Co., 587 Market St., S. F. 61 Fourth St., Portland.

SAFES
- Herring-Hall-Marvin Safe Co., 36 Second St., S. F.

SAFETY TREAD
- Murphey & Orton......268 Market St., S. F.

SAND FOR CONCRETE
- Kruttschnitt Company Pacific Bldg., S. F.
- L. E. Chattock,......1087 Natoma St., S. F.

SANITARY FLOORING
- "Magnolith," Portland Sanitary Floor Co., 185 Jefferson St., Portland
- "Raecolith," Pacific Builders Supply Co., Builders' Ex., S. F., and Raecolith Co., 71 First St., Portland

SANITARY SPECIALTIES
- D. H. Gulick..............Lick Bldg., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

SCHOOL FURNITURE AND SUPPLIES
- Spencer Desk Co....Monadnock Bldg., S. F.
- Whitaker & Ray Co.....141 Grove St., S. F.
- C. F. Weber & Co.......1151 Polk St., S. F. 210 N. Main St., Los Angeles

SHEET METAL WORK
- W. Heidt Cornice Works..152 First St., S. F.
- Feldman & Sommer, 134-136 Fourteenth St., S. F.
- Yager Sheet Metal Work, 1006 Seventh St., Oakland
- Chas. S. Amsler........25 Shotwell St., S. F.

SHINGLE STAINS
- Parker, Preston & Co., Whittier-Coburn Company, San Francisco and Los Angeles, Pacific Coast Distributors.

SLATERS' CEMENT
- Western Builders' Supply Co., Representing Clinton Metallic Paint Co., Clinton, N. Y.

SPANISH TILE
- Gladding, McBean & Co. 311 Crocker Bldg., S. F.
- Meurer Bros.......Builders' Exchange, S. F.
- Walsh & McCrory..154 Clinton Park, S. F.
- San Francisco Metal Stamping Co., 296 Eleventh St., S. F.

SPIRAL CHUTES
- Haslett Warehouse Co., 310 California St., S. F.

STABLE STALLS AND FIXTURES
- Howe Scale Co...........143 Main St., S. F.

STAMPED SHEET METAL ORNAMENTS
- San Francisco Metal Stamping & Corrugating Co., 296 Eleventh St., S. F.

STANDARD SCALES
- George A. Riggs, rep. The Howe Scale Co.................143-149 Main St., S. F.

STEAM POWER PLANTS
- The Tracy Engineering Company, 823 Sheldon Bldg., S. F. 700 Central Bank Bldg., Los Angeles

STEEL BARS FOR CONCRETE REINFORCEMENT
- Woods & Huddart....356 Market St., S. F.
- Tayler & Spotswood Co., Minnesota and 19th Sts., S. F.

STEEL ERECTING
- C. A. Blume ......185 Stevenson St., S. F.
- Wm. B. Abbitt Construction Co., 370 Monadnock Bldg., S. F.

STEEL FURNITURE, LOCKERS, ETC.
- Chas. M. Finch...........Boyd Bldg., S. F.
- Williams & Carter Co.....197 Jessie St., S. F.

STEEL MOULDINGS FOR STORE FRONTS
- J. G. Braun, 537 W. 35th St., N. Y., and 322 S. Paulina St., Chicago

STEEL STUDDING AND LATH
- Lilley & Thurston.......82 Second St., S. F.

STREET PAVING
- Worswick Street Paving Co.....Fresno, Cal.
- Warren Construction Co., 217 Beck Bldg., Portland, Ore.

STRUCTURAL STEEL CONTRACTORS
- Mortensen Construction Co., 19th and Indiana Sts., S. F.

STRUCTURAL STEEL AND IRON
- Brode & Clark Iron Works, 621 Howard St., S. F.
- Burnett Iron Works.............Fresno, Cal.
- City Iron Works....303 Front St., Portland
- Dyer Bros......17th and Kansas Sts., S. F.
- Woods & Huddart......356 Market St., S. F.
- Pacific Iron Works...........Portland, Ore.
- Northwest Bridge Works......Portland, Ore.
- Pacific Rolling Mills, 17th and Mississippi Sts., S. F.
- Western Iron Works......125 Beale St., S. F.
- Joshua Hendy Iron Works, 75 Fremont St., S. F.
- Tayler & Spotswood Co., Minnesota and 19th Sts., S. F.

TANKS
- Pacific Tank Company..318 Market St., S. F.

THEATER CURTAINS
- Elevator Supply & Repair Co., 593 Market St., S. F.

TILE, MOSAIC, MANTELS, ETC.
- Mangrum & Otter....561 Mission St., S. F.
- Oregon Art Tile Co., 311 Stark St., Portland
- W. W. Montague..Polk St., near Eddy, S. F.

VACUUM CLEANERS
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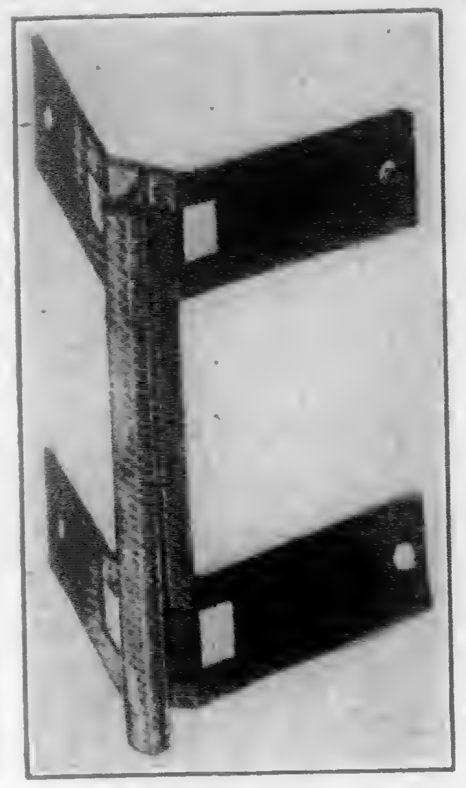
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THE GARRY IRON & STEEL COMPANY, Cleveland, Ohio

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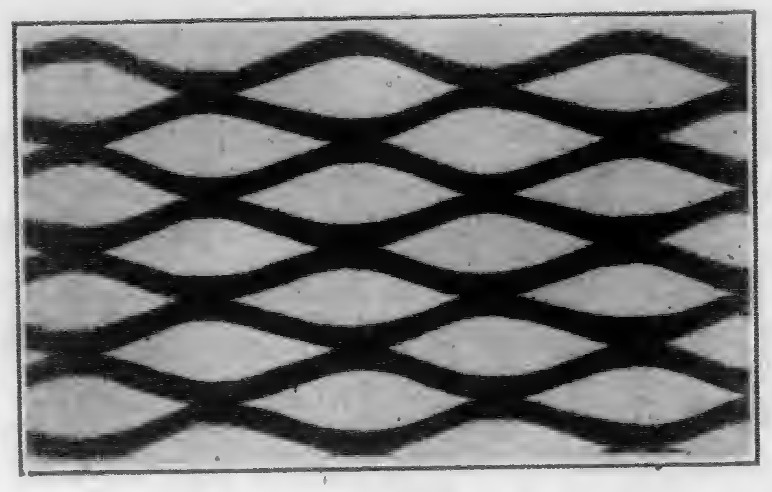
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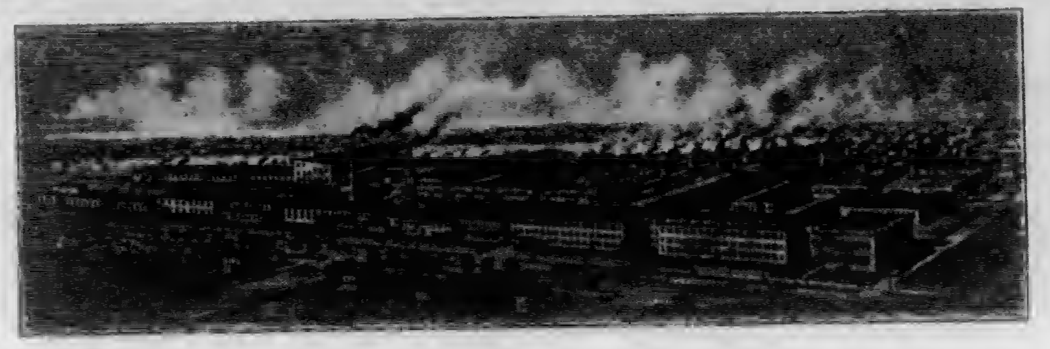
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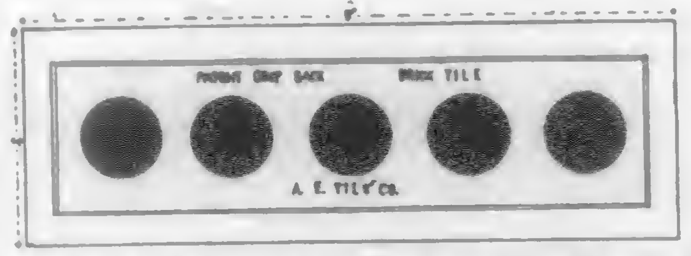
We request ARCHITECTS to specify:

"American Encaustic Tiling Co.'s Patent Grip Anchor Back 'Standard' quality Wall Tiles and Trimmers must be used in this work unless written consent is given by the Architect to substitute another make."

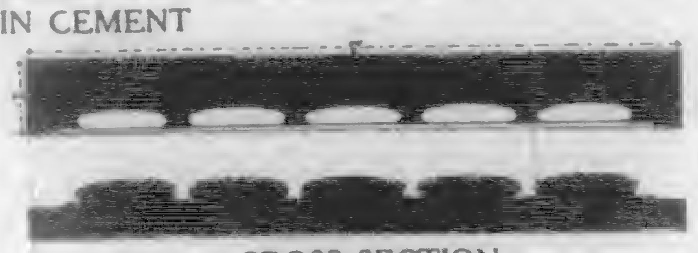
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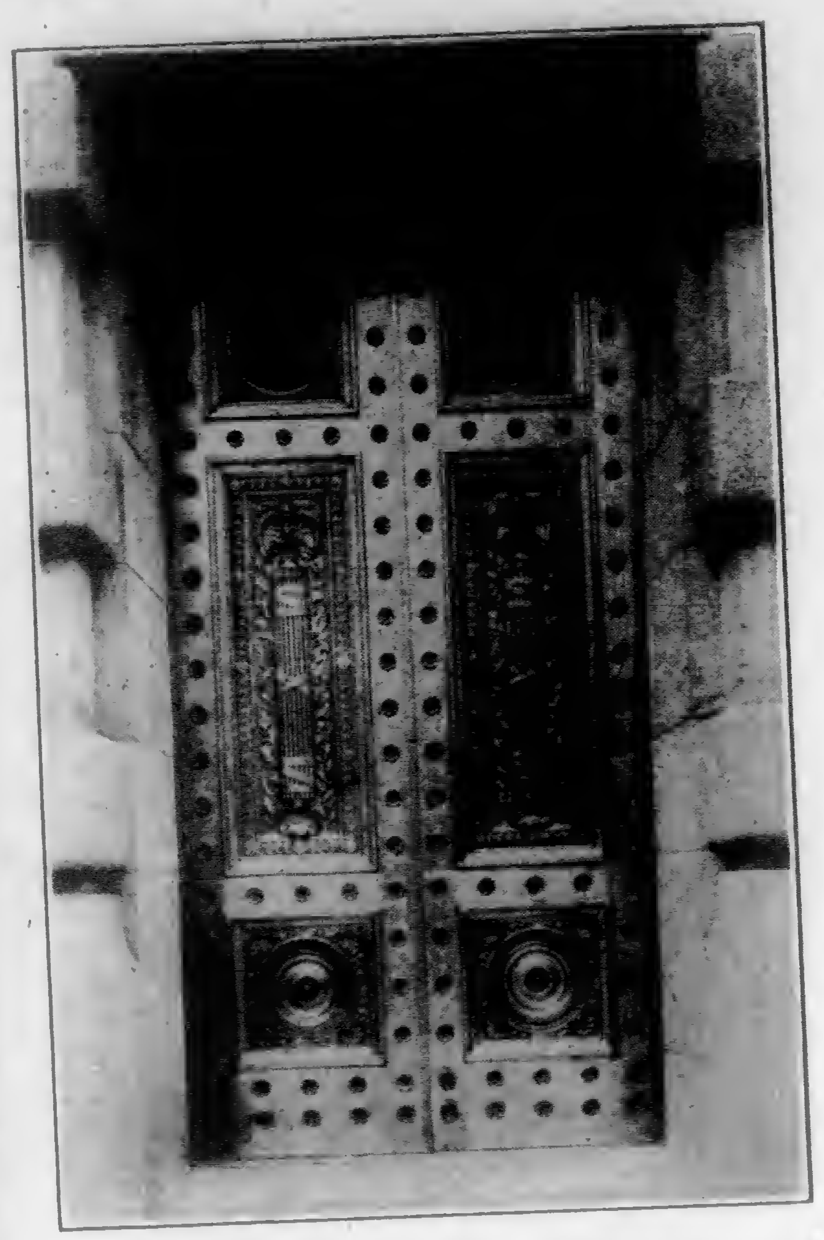
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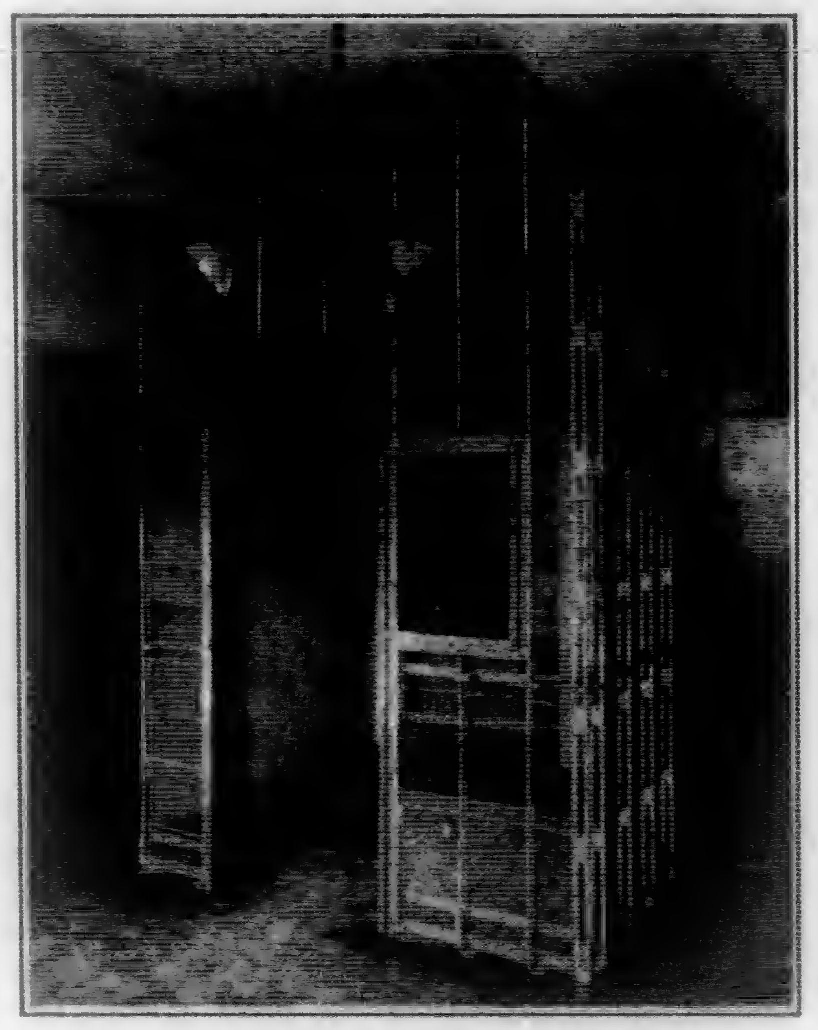
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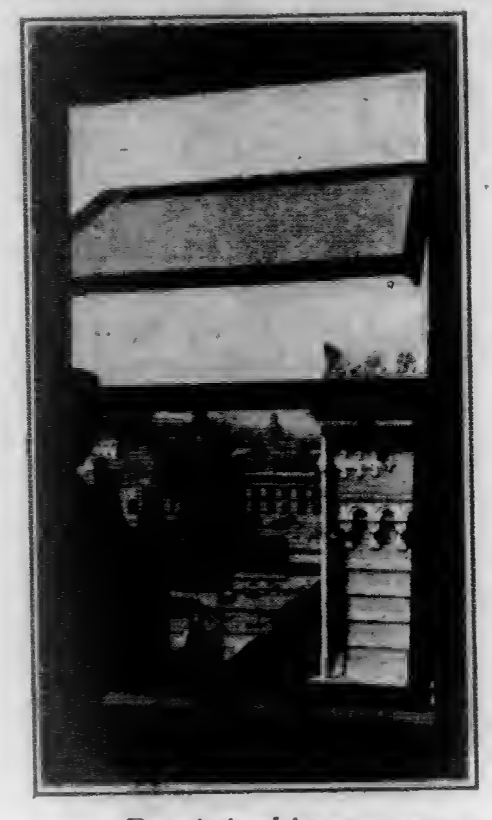
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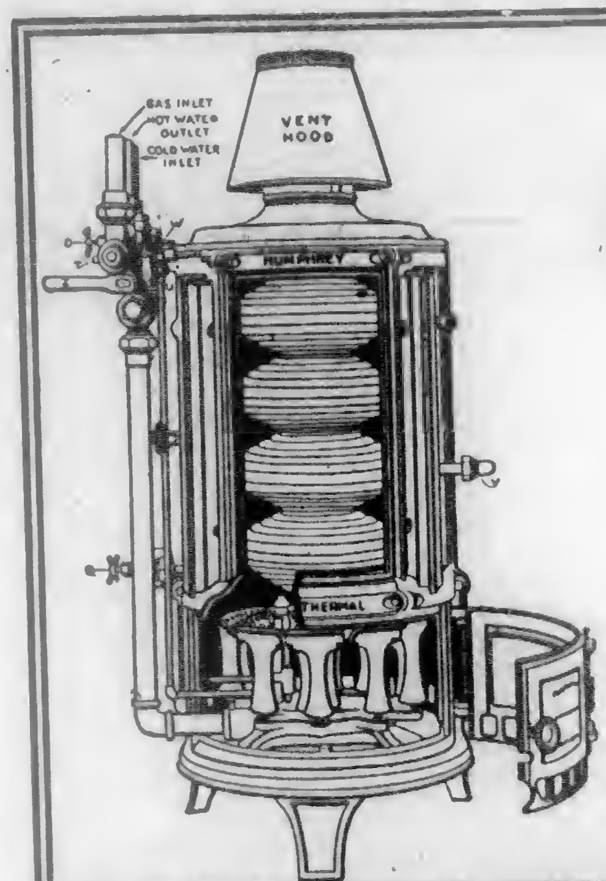
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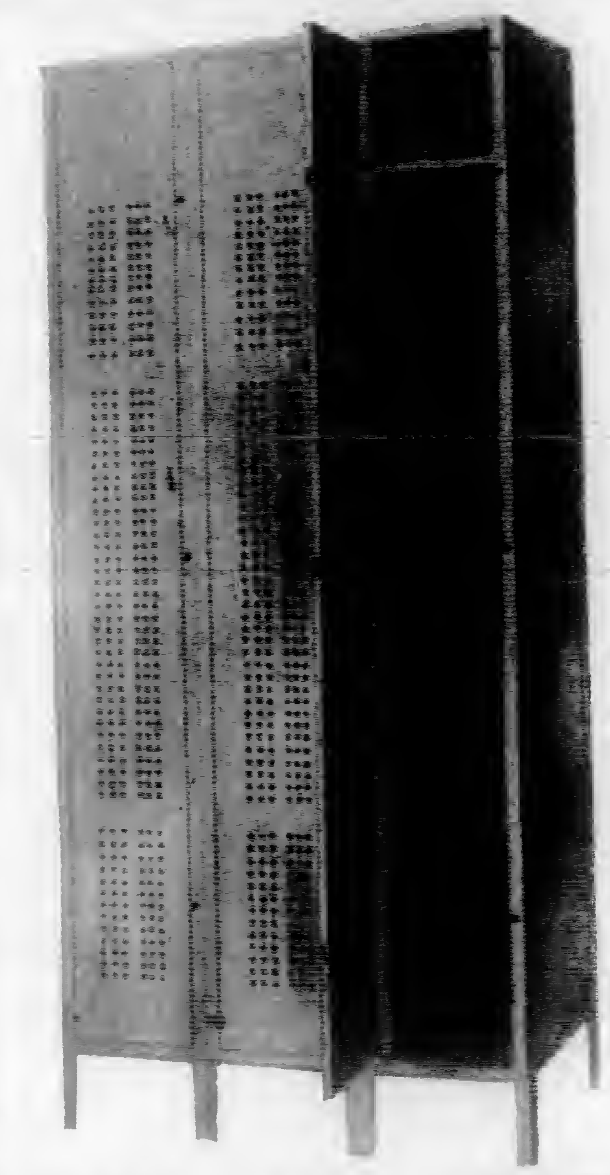
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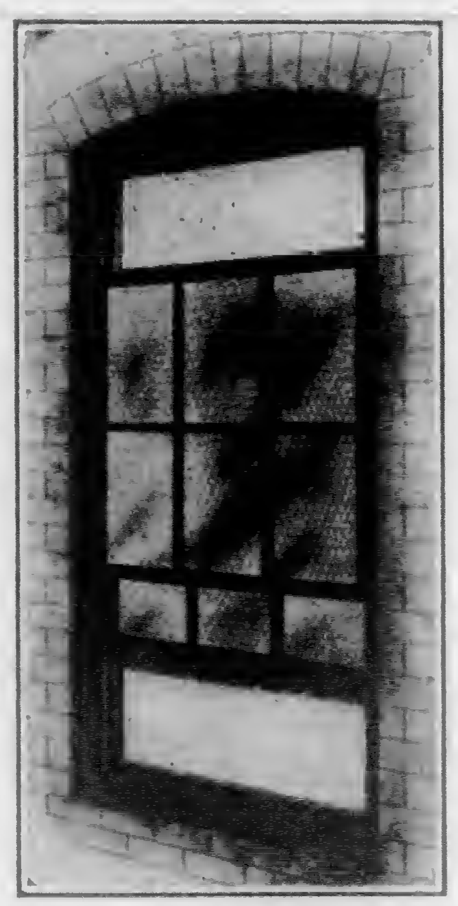
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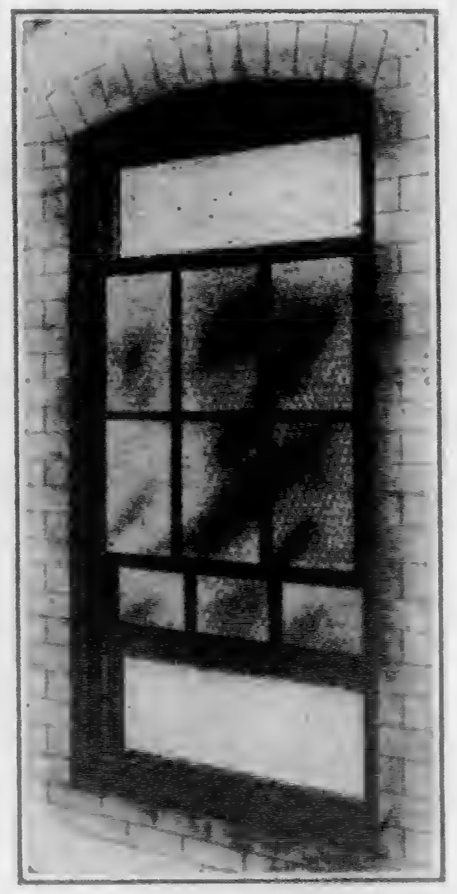
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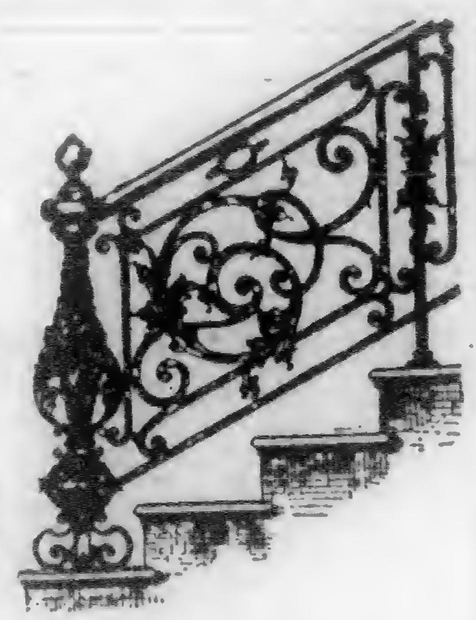
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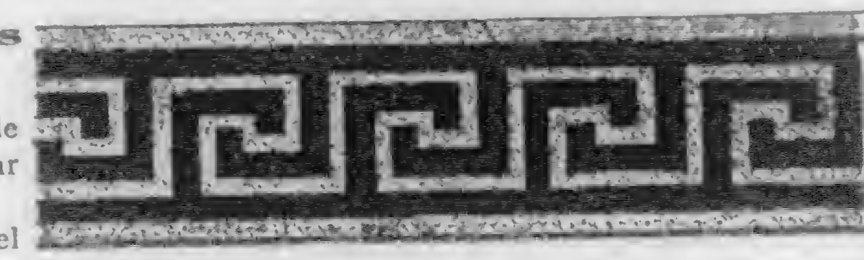
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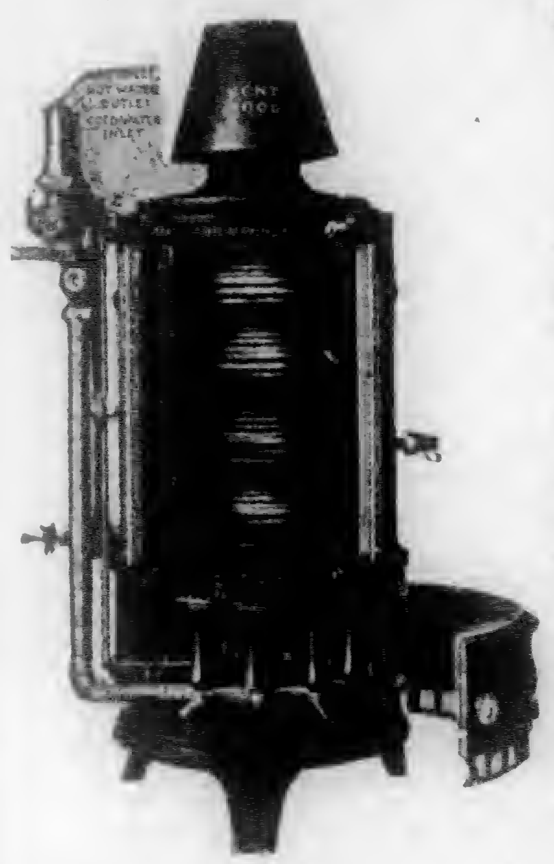
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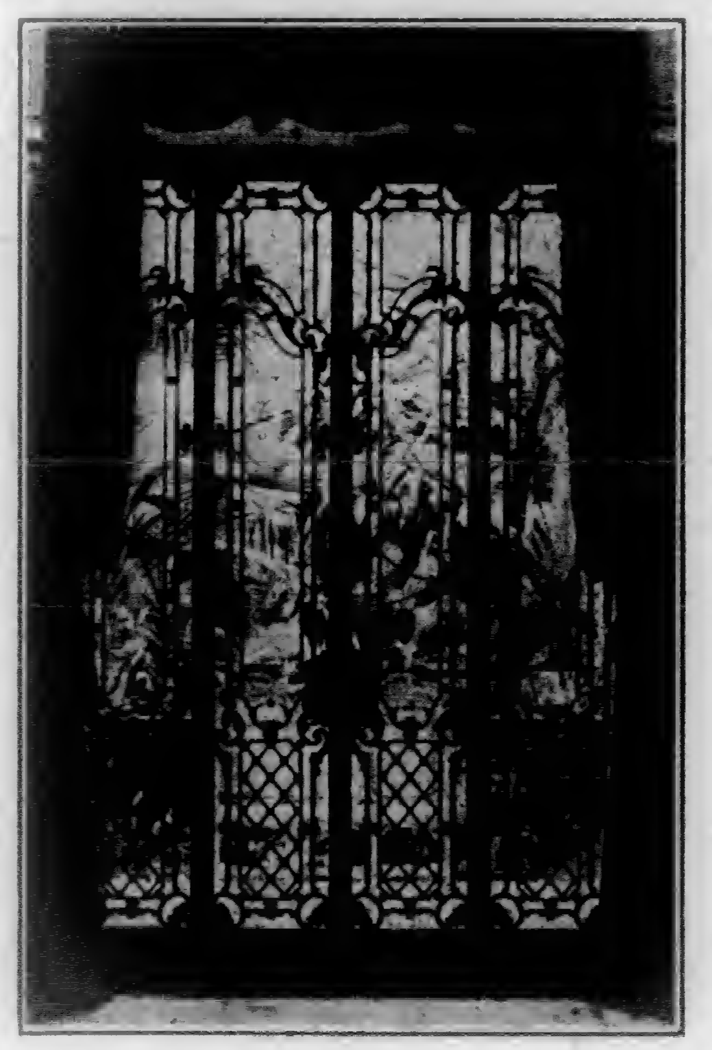
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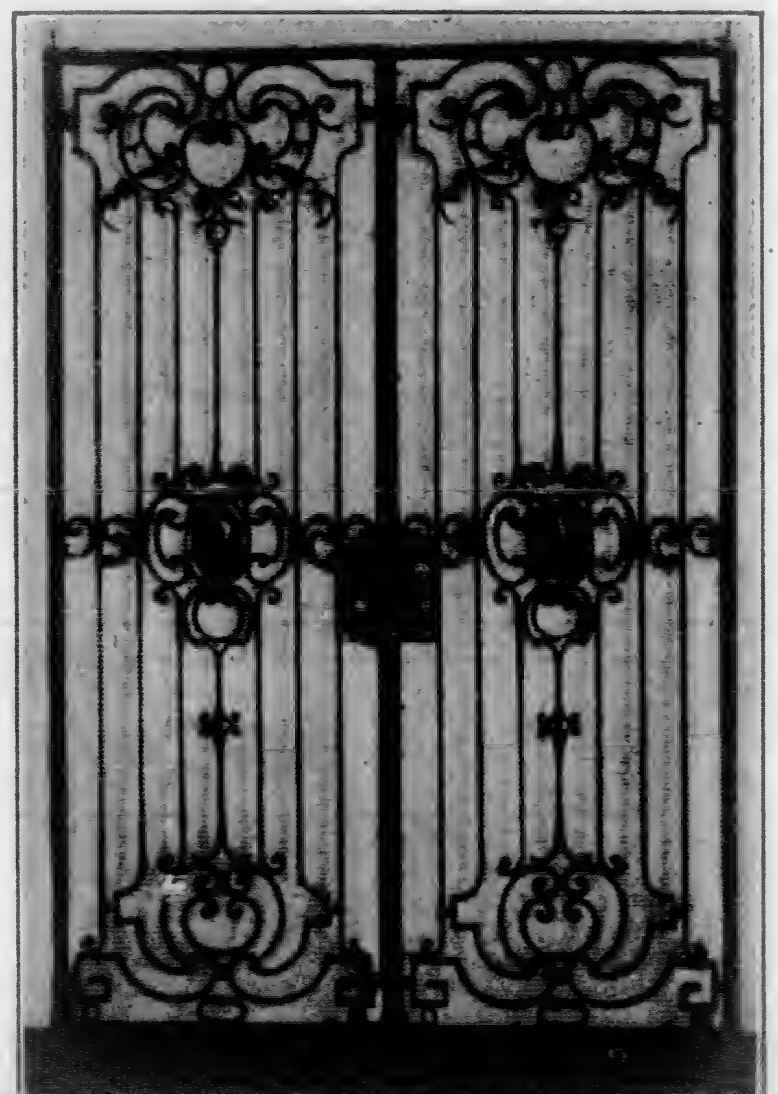
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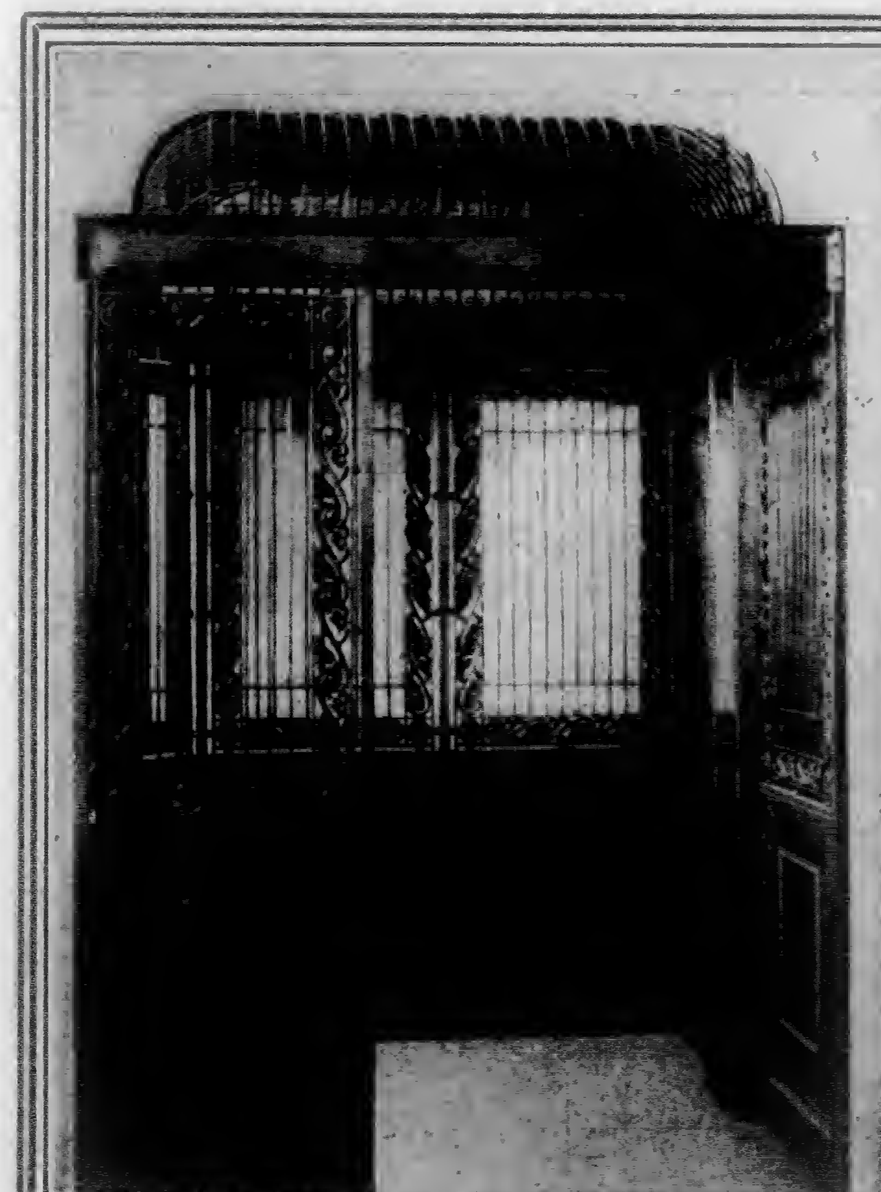
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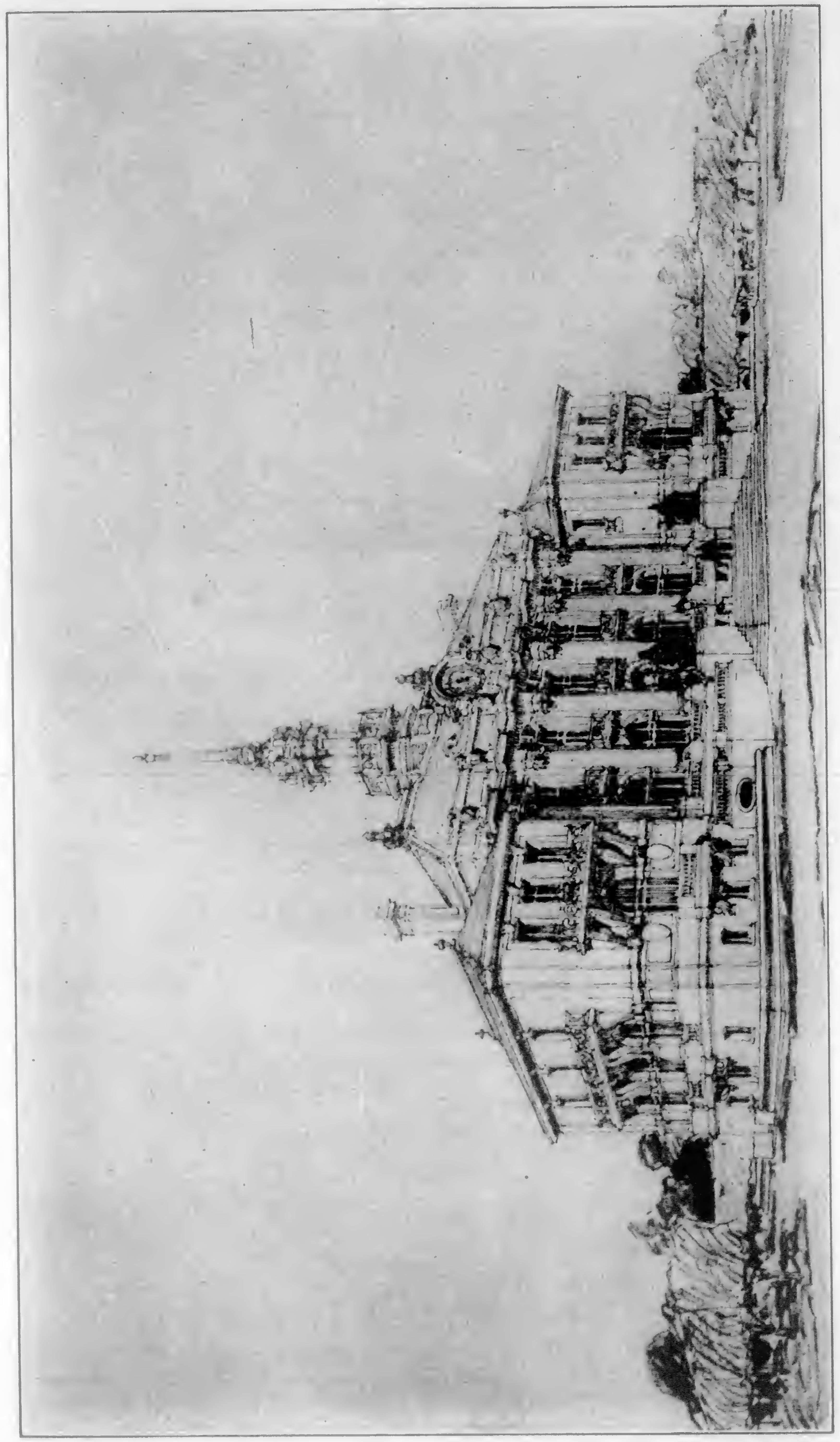
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San Francisco, Cal.

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Contents for February

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Accepted Design for Town Hall, Berkeley, Cal.
Bakewell & Brown, Architects

Frontispiece,
The
Architect and Engineer of California
February, 1909

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XVI. FEBRUARY, 1909. No. 1.



Residence of Mr. George Hammer, Oakland
Bakewell & Brown, Architects

Some of the Work of Bakewell & Brown, Architects.

THE accompanying illustrations show some typical examples of the work of Architects Bakewell & Brown of San Francisco. It may be noted that an attempt is made to treat each problem that arises in a logical manner, without any affectation, and as each building has its own special requirements, and each client his own ideas and predelictions, the architects have been able, without sacrificing any of their own ideals, to get a great deal of variety in their work.

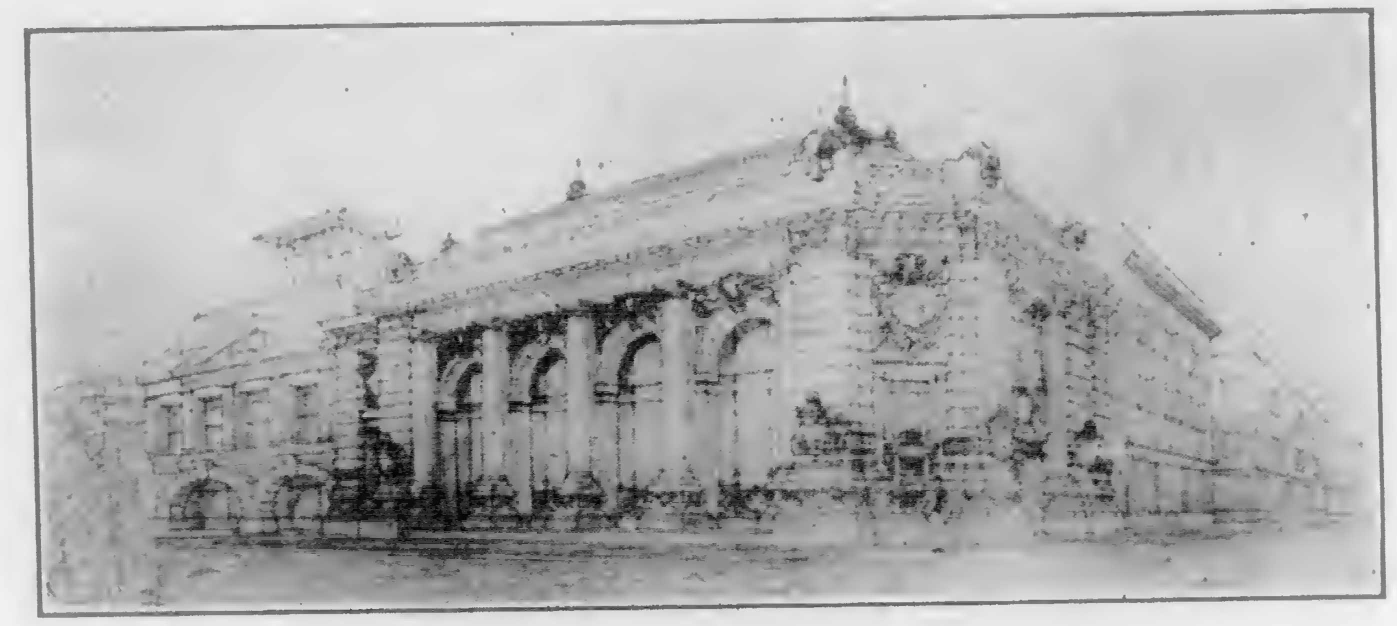
The firm of Brakewell & Brown was established in San Francisco about a year before the great fire.

Both members of the firm are graduates of the University of California, also of the Ecole des Beaux Arts. Mr. Brown had an especially distinguished career in Paris, having won several medals of the Ecole des Beaux Arts, and also the Rougevin and Godeboeuf prizes.

After finishing their school work Messrs. Bakewell & Brown spent several years in eastern offices before becoming established in business in San Francisco in the year 1904.



The Burns' Monument, Golden Gate Park, San Francisco
Earl Cummings, Sculptor
Bakewell & Brown, Designers of Pedestal



Competitive Design for Bank, Oakland
Bakewell & Brown, Architects



Competitive Design for Bank Building, San Francisco
Bakewell & Brown, Architects



Pylon, Piedmont Heights, Oakland, Cal.
Bakewell & Brown, Architects



Competitive Design for an Oakland Bank
Bakewell & Brown, Architects



Street View of the George Hammer Residence, Oakland
Bakewell & Broun, Architects



Mr. S. B. McKee's Residence, Oakland
Bakewell & Brown, Architects



Pylon, Piedmont Heights, Oakland, Cal.
Bakewell & Brown, Architects



Competitive Design for an Oakland Bank
Bakewell & Brown, Architects



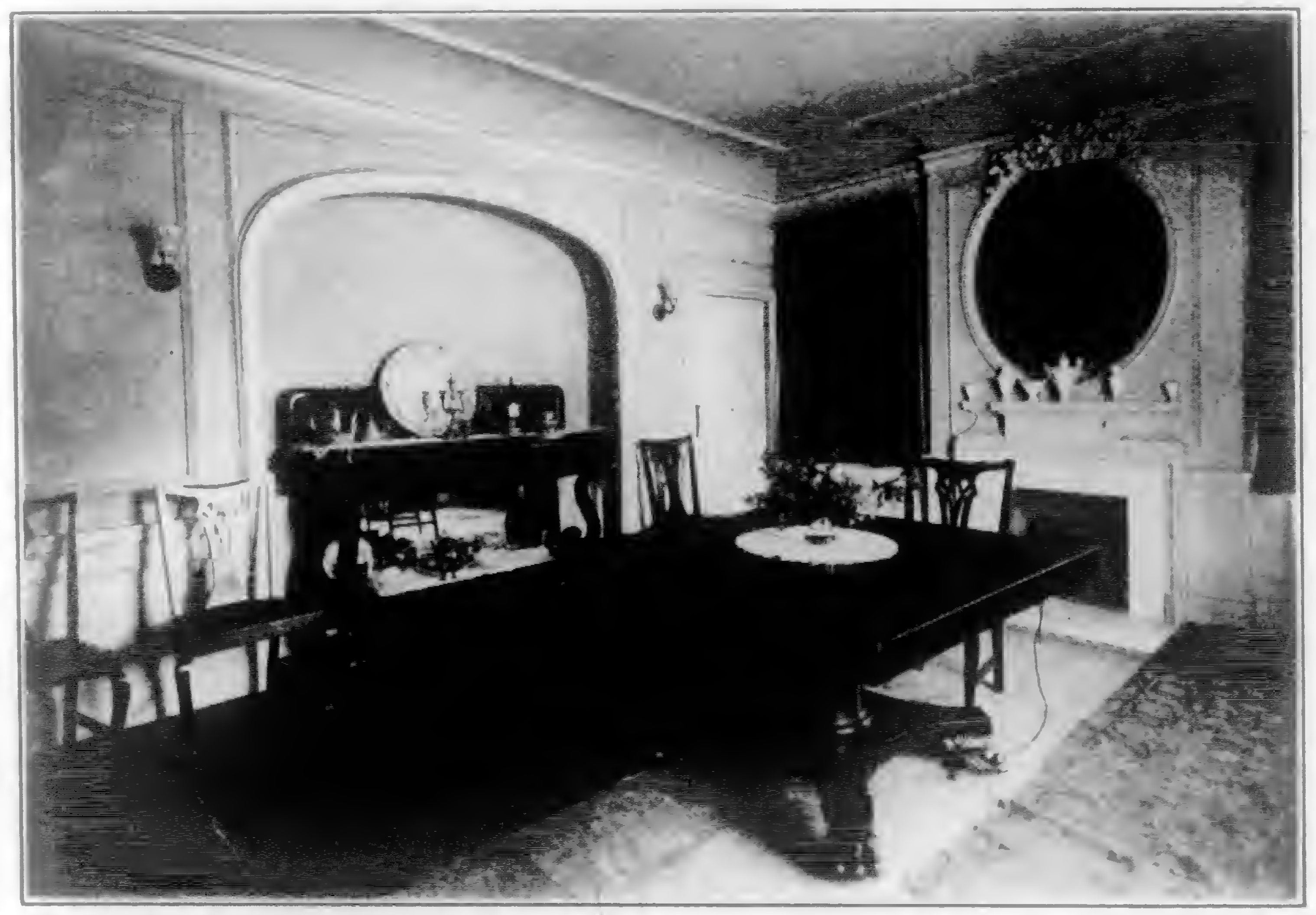
Street View of the George Hammer Residence, Oakland
Bakewell & Brown, Architects



Mr. S. B. McKee's Residence, Oakland
Bakewell & Brown, Architects



Mr. S. B. McKee's Residence, Oakland, Cal.
Bakewell & Brown, Architects



Dining Room in McKee Residence, Oakland
Bakewell & Brown, Architects



Residence of Mr. F. C. Martens, Oakland, Cal.
Bakewell & Brown, Architects



The Sloat Monument, Monterey, Cal.
Bakewell & Brown, Architects
Cummings & Putnam, Sculptors



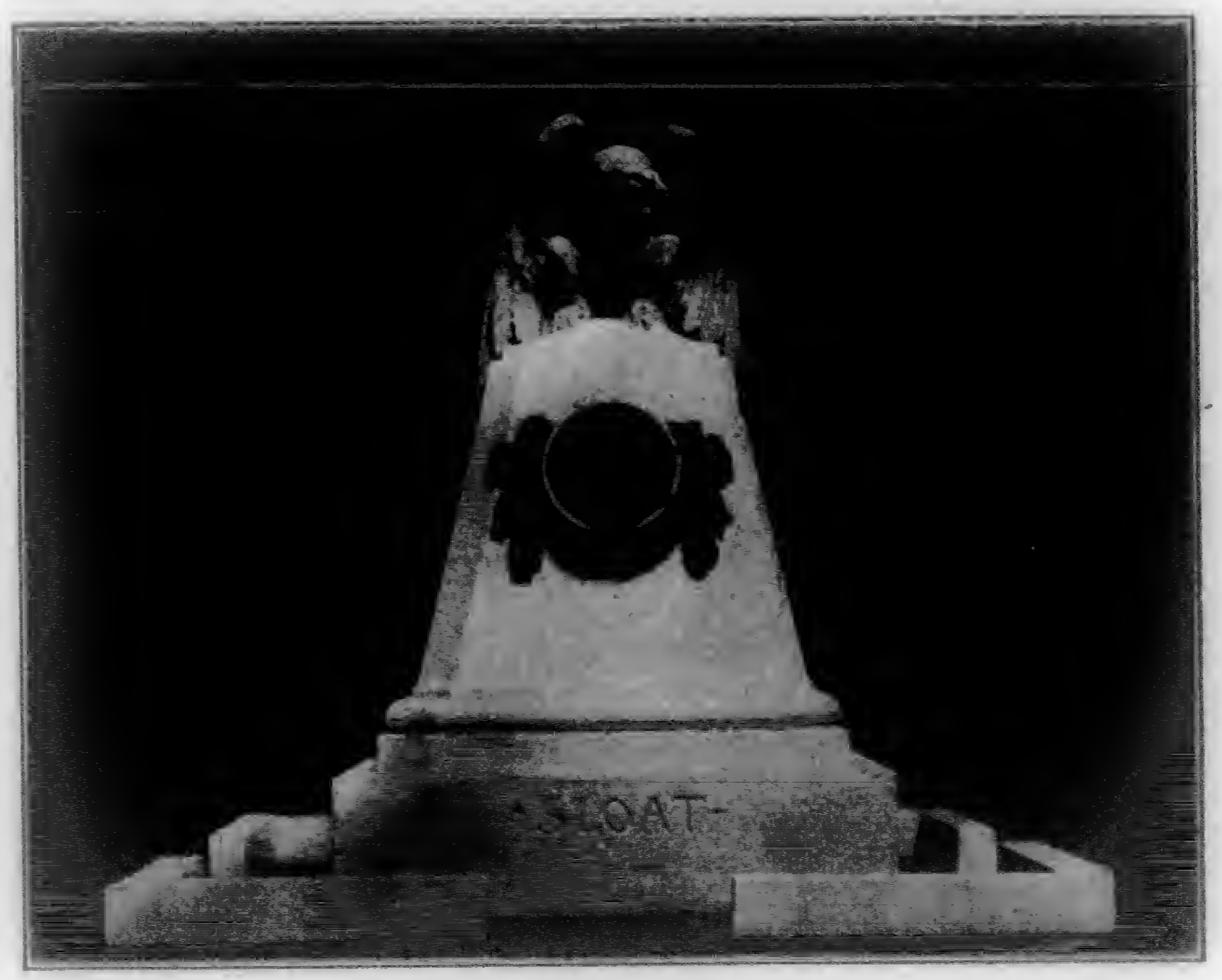
Mr. S. B. McKee's Residence, Oakland, Cal.
Bakewell & Brown, Architects



Dining Room in McKee Residence, Oakland
Bakewell & Brown, Architects



Residence of Mr. F. C. Martens, Oakland, Cal.
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The Sloat Monument, Monterey, Cal.
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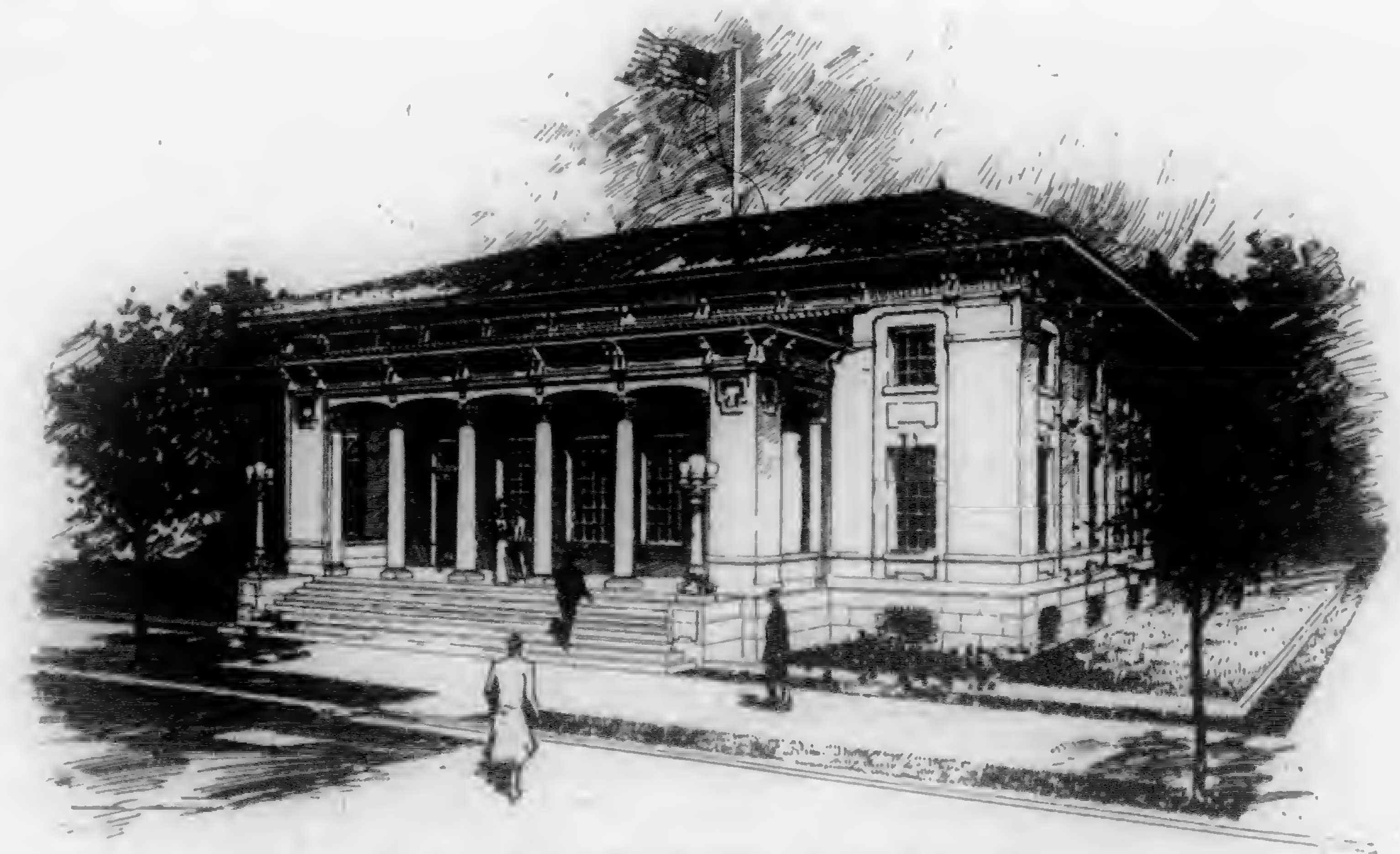
House of
Mr. A. S. Macdonald,
Oakland
Bakewell & Brown,
Architects



Pencil Drawing of one of Several Residences Built at Palo Alto for Members of Stanford University Faculty
Bakewell & Brown, Architects



Braley Grote Building, Oakland
Bakewell & Brown, Architects — Equipped with Otis Elevators



The New Post Office Building, Santa Rosa, Cal.
John Knox Taylor, Supervising Architect — Hoyt Bros., Contractors



Interior Oakland Bank of Savings, Oakland, Cal.
C. W. Dickey, Architect

Government Begins Investigation of Clay Products.

AN INVESTIGATION of clays and clay products needed in Government work is to be undertaken at once by the United States Geological Survey, Technologic Branch. A ceramic section has been created with A. V. Bleininger, of Champaign, Illinois, as ceramic chemist.

This is an important extension of the structural materials investigations which have been carried on for several years with a view to determining the nature and extent of the materials belonging to or available for use in the building and construction work of the Federal Government, and how these materials may be used most effectively.

With the growing scarcity of timber and the consequent increase in price, federal officials in charge of the construction work, which now amounts to $40,000,000 annually, have been looking about for desirable substitutes, such as clay products and concrete. The enormous fire losses of the country have also been an incentive in this direction, the Federal engineers realizing more than ever before the need for more definite knowledge concerning the fire resisting properties of structural materials.

All this has lead the government to take up a general investigation of the clays and clay products.

It is believed that the coming tests, though conducted to meet the needs of the government, will be of great value to the engineering profession and the general public. This construction work of the government is being done under so many different conditions and requires so great a variety of materials, that the problems which the government needs to have solved for its own purposes can hardly fail to be broad enough to cover a large share of the needs of the engineering profession, for state and municipal governments and for the general public.

The Great Pyramid of Gizeh

In Two Papers—II.*

By JAMES DICKIE, M. E.

THERE are three kinds of stone in the pyramid. The interior body is of yellow limestone found in the neighborhood. The outer stones and part of the passages are of finer white limestone found on the opposite side of the Nile in the Mokattam, 12 to 14 miles distant. The lining of the king's and queen's chamber and the stones used to block the passages after the coffins were in place were of very hard black granite, which is one of the most lasting and hardest stones in existence.

This stone is found about 580 miles up the Nile from where the pyramids are built. Many of the statues in the museum at Cairo are made of this stone and the red granite, some of which are as old as the pyramids, and so far as the stone is concerned they show little signs of decay. Some of them have pieces broken off, but the stone itself is in good state of preservation. The design is stiff and not to be compared with those of a later period, but the workmanship is good and they must have had good tools to cut that extremely hard stone.

We are left entirely to our own imagination as to how these stones were brought from the quarries and placed in their present position. The history of the kings themselves and their wars and conquests (no defeats) are engraved on the stones in many of the tombs, in hieroglyphics, which can now be translated. The engravings show us many things about their gods and their worship, and the look of the dead tell us of their beliefs in a future state and shows many pictures of the transporting of the bodies in boats on the river to their final resting place.

The writer looked in vain at the engravings and papyrus in Cairo Museum (said to be the largest of its kind in the world), also in the British Museum, for the method of handling the large stones. We do find a rude engraving showing the transportation of a large obelisk which weighed about 375 tons, of a much later date, being transported down the river in a boat, the obelisk being on deck, also the history of how it was done.

Many representations can be found of all the ordinary arts, such as plowing, sowing, reaping, grinding corn, feeding of animals and sacrificing them, carpentry (showing all the methods of sawing, planing and fitting wood together, brick making, boatbuilding and every domestic art), and, as I mentioned before, numerous engravings showing the transportation of the dead on the Nile to their final resting place. There are extremely numerous representations of the worship of all kinds of gods; they worshiped everything under the sun, including the sun, moon and stars. All the simpler things are profusely illustrated.

I pondered over the subject, but could find no solution, unless it be in the well known fact that until less than two centuries ago there was a wide gulf between the literary man and the mechanic. They were far apart and the one despised the other. There were all kinds of trade guilds, and they kept the secrets of their trade as closely guarded as free masonry. It is only within a very late period that any discussion by any of the members of the societies of the mechanical arts were published; they handed down the trade secrets from father to son, but no record of them was ever written down.

The purely literary man ignored the mechanic, and the mechanic distrusted the literary man. Whoever was responsible for the transporting of the stones down the Nile must have laughed at the representations of the boats cut in the tombs and positively refused to give either the artist or the literary

*The first installment of this article appeared in the January number of "The Architect and Engineer."

man any information. When he looked at the representation of the boats carrying the dead he knew that no living man could venture in them or he would soon be among the dead.

None that I saw, drawings, engravings or models, of that early period (later ones were a little better) would float right side up, and the mechanic knowing that, would not be willing to give the scribe any information for fear it would be inscribed wrong; while he had not the literary ability or the desire to record it himself.

As we have no record we are forced to use our own imagination as to how it was done. Our only guide is the stones themselves. To the ordinary mechanic of today the subject presents no difficulty. Some of the stones in the quarry left unfinished tell us how they quarried the largest stones. They simply finished the outside, ends and top and bottom while the stone was in its natural position in the quarry and then cut it off.

There are representations in ancient Nineveh showing the stone moved on rollers by man power, which is probably the way the stones for the pyramids were handled. It is a well known mechanical fact that man can move any given weight at less cost for feed than any other animal. Hence it was the cheapest way and was most likely used to drag them to the water.

Taking the largest stone which we mentioned before as being 64 tons; 90 men could move that on rollers on level ground without any other mechanical appliance than an ordinary rope to pull on, at a speed of 10 to 12 miles per day, in the same way as the representations at ancient Nineveh show. This is likely the way that it was done. When they got to the banks of the Nile it had to be floated down the river.

The writer thinks they built a boat around the stone of sufficient size to float it, in the same manner as the coal floats are made on the Mississippi River today, breaking the boats up when they arrived at their destination.

These boats could have been on the bank of the river, so placed that when the river rose it would float the boat. Then they proceeded down the river, landing opposite the pyramid, so that when the river fell the boat could be taken apart and the stone transported on rollers to the pyramid.

The smaller stones could be taken down the river on boats or rafts of timber in the same manner. The timber could be used for tressels to roll the stones up on the pyramid.

This appears to be the way that it was done. Of course it was a laborious and slow process, as the pyramid is nearly as high as a 40 story building. The tressel or embankment to roll the stone up would be between two and three miles long, not a very difficult feat, and not very costly. This method could have been easily employed, and none of the present day methods of hoisting material used.

The writer thinks that they had some knowledge of the mechanical appliances of today. The use of the lever dates back as far as history goes, and it is supposed that the ancient Egyptians were familiar with its use.

While passing through the passage to the king's chamber, one of the stones used to block the passage after the bodies were in place attracted my attention. It was made to slide down in a groove in each side of the passage and was in a position so the visitor could pass under it. Upon examination the stone was found to be grooved on the ends deep enough to take a rope. They were about 2 inches in diameter and about 1½ inches apart. My attention was riveted to the stone, and I stopped to examine it. I could see no other use those grooves were for except to house the rope or other appliance they had for lowering it into place. This was the only stone that I saw that had any mark or indication on it of how it was placed in position. Of course when the stone was in position these grooves could not be seen, so it is possi-

ble that others of the stones have marks on them that are covered up. This particular stone would not weigh more than 6 tons. The grooves may have been for some other purpose, but if they were used for lowering the stone into position, the same means could have been used for hoisting the stone originally, as one that can perform the first operation can perform the second.

Thus it seems that they had the means for hoisting the materials and no record of it came down to us, or probably has never been made at all.

How many people know today how the center portion of the Forth Bridge was placed in position, and it is a much more difficult piece of engineering than the construction of the entire pyramid. The most difficult piece of any structure is the gauge of its difficulty, and we saw that a 64-ton stone was the most difficult piece to handle.

The average literary man or popular writer takes no notice of these things, and the people who accomplish these feats seldom care to record them or to let others do so, and if they do, take no care to preserve the records. The last statement refers to the time up to 200 years ago.

The writer does not know of any kind of structure that would have been better adapted for the employment of all kinds of labor at that time than the pyramid.

The design is simple and does not require much skill to put it on paper, and it is so comprehensive as to use all kinds of labor in the proportions in which it was found then. It called for the road engineer to design roads to transport material on land, the naval architect to design the boats or floats to transport the material on water, the skilled stone cutter to shape the stones in the quarry so they would fit in their place when they arrived there, the carpenter to construct the boats or floats to transport the stone, and the tressels for getting them to their place in the structure.

Then came the large bulk of common labor, the hewers of wood and the drawers of water, overseers of the various departments, superintendents of the whole work, and lastly the cooks to provide food for the whole army of workers. In a word, all kinds of labor was employed, and that in vast quantities.

The writer thinks there were three reasons for building it.

First—To perpetuate the memory of the builder and provide a tomb for his body.

Second—To utilize the surplus labor of the country and so prevent idleness, with all its attendant evils.

Third—To train the brains and muscles of those building it so they would be ready and capable to undertake any war, either offensive or defensive.

The great pyramid designed by Kheops was the most lasting monument that the human mind could conceive. The form enables it to be made any size by simply adding on the outside. The pyramid was complete as every course was added. They were generally started when the king ascended the throne and completed shortly after his death.

This particular one was supposed to have been 30 years in building. If the rate of building were constant the size of the finished pyramid would closely indicate the length of the king's reign, so that a king that had a long reign would have a larger monument to preserve his memory. With no other form of building could this idea be carried out.

The writer does not think that there is any astronomical meaning to the position of the pyramid, nor to the angle of the main passage, but thinks it was simply designed to be a lasting monument, and if so was a grand success. The most elaborate and massive temples erected at the same time and thousands of years later have almost entirely disappeared while this monument stands today and will stand for thousands of years to come.

In all countries and at all times there has been a part of the population that appears to be surplus. In other words, man can produce more food than he can consume. This is especially so in countries like Egypt, where the soil is prolific and the climate such as to require little or no clothing.

Also in Egypt there were portions of each year in which there was no work to be done on the soil, when the river was in flood and the land was covered with water, and again when there was no water, and no irrigating could be done.

The rulers saw those things and devised great national monuments to utilize this labor. While those working on the pyramid and in the quarries and other great national works could work all the year round, the stones would be transported down the river and across the river when it was in flood, just at the time when the farmer could not work on the soil.

Nothing could be devised that could better utilize all kinds of labor than works of this kind and the design was admirably suited to it. If common labor was more abundant, the roads could be enlarged and the production and transportation could be made to go a little faster. If the mechanics increased, the stones could be made larger and thus would be more difficult to handle. This made more skill necessary to handle them. The design admitted of using any amount of any kind of labor.

If the river men became more abundant, bring more of the stone across and more from the quarries 580 miles distant. Thus the labor could always be utilized with little thought on the part of the management.

All of the people could thus be kept busy and given no time for idleness and for concocting plots against the government. When Moses (the greatest labor leader in the world of his time and since, and who engineered the greatest strike the world has ever seen) went to Pharoah to ask for the freedom of the Jewish people sixteen centuries after the building of the pyramid, Pharaoh immediately said, "Ye are idle", and ordered the overseers to increase the tale of the bricks demanded from the Israelites. The mistake he made was years before when he educated Moses (an alien) in all of the learning of the Egyptians.

Moses knew all the secrets of the management of the people as well as Pharaoh. He saw how the people were controlled and knew he could do it as well as Pharaoh.

The building of the great pyramid not only employed all kinds of labor but it developed leaders of men, which is the most important thing. Pharaoh knew that to preserve the country he had to have men capable of defending it, and capable leaders for those men, and building these immense monuments was the very best way to develop them.

The art of war in those days did not call for the same drilling as at the present day. It required strong men that could endure hardship; men that could go into a wild country and make their way, who, when they came to a river could devise means to cross it.

Nothing could fit men better for that task than this very labor. They had to construct all kinds of floats to get the stones down, or across the river, and had to make them out of the natural resources of the country. They had to construct all kinds of mechanical appliances to handle the material. Their brains and muscles were thoroughly trained and their patriotism was kept at the highest pitch to defend and preserve these great monuments that they had built.

Thus Pharaoh had a well-trained and patriotic army that could not be beaten. The history of all nations since the beginning of time has shown that when the nobles or rulers of any country became so luxurious and lazy as to neglect the design and superintendence of great works, the lower class became

idle and criminal, and the country fell an easy prey to any vigorous nation that attacked it.

The writer believes that the principal reason (after perpetuating the honor and glory of the reigning monarch) was to produce muscular contented men, and the present day rulers would do well to heed the lessons of the past, of which the great pyramid of Kheops is a shining example. The only difference the writer would suggest would be to make the great national works some use, such as great irrigation works; the improvement of harbors and rivers, the construction of good roads, to be followed by fine national buildings.

The writer wishes to acknowledge the debt of gratitude he owes to explorers and writers who have explored those great works and taken the pains to carefully measure them up and describe them and would advise anyone contemplating a visit to them to study all the writings on the subject before his visit, so he will derive the full benefit of his experience.

* * *

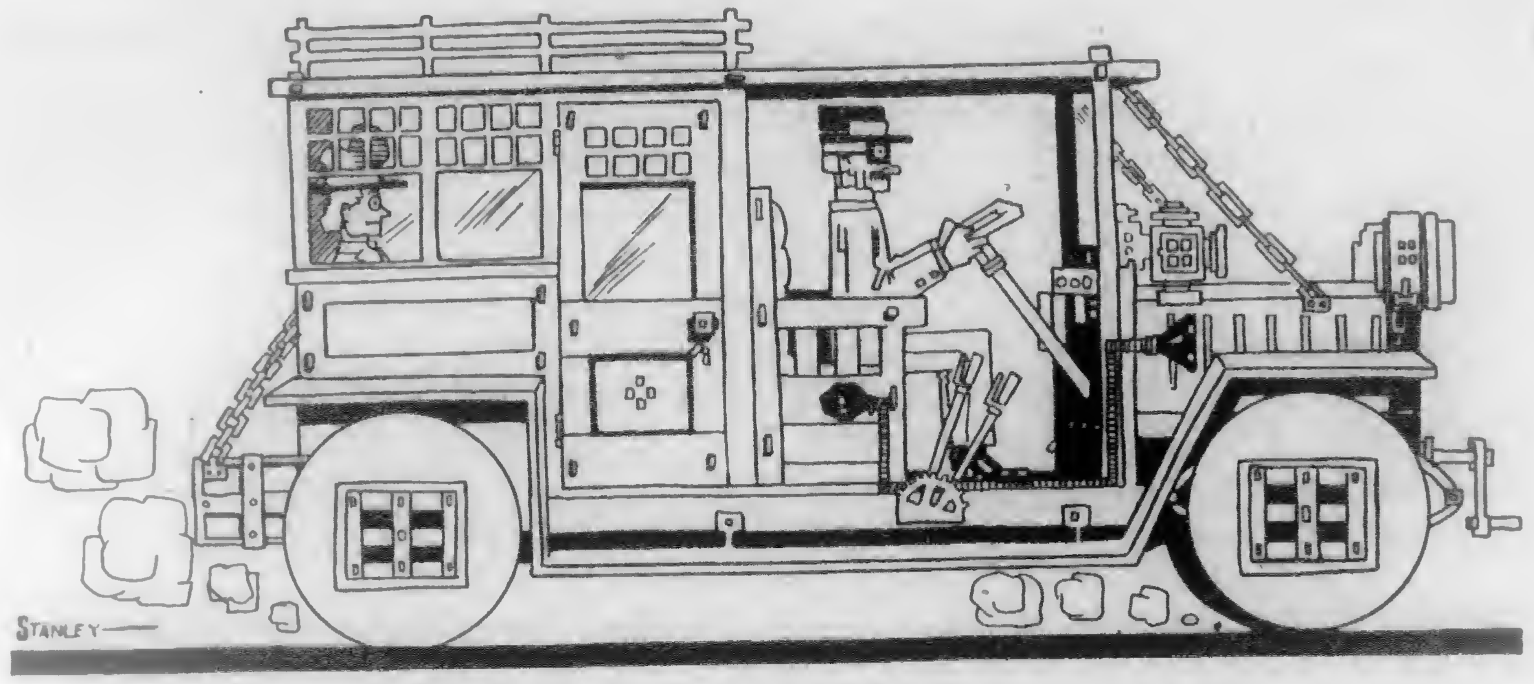
How to Paint Over Cement.

IT IS not safe to paint over the surface of cement until it has stood exposed to the weather for about one year, unless the surface has first been sized with acid water to kill the alkali, and even then there is some danger of bad results. Here is a somewhat tedious method for preparing and painting such a surface, but it has the sanction of some of the best painters, says the Master Painter: Slack one-half bushel of fresh stone lime in a barrel and add in all twenty-five gallons of water; when slacked and cold add six gallons of the best cider vinegar and five pounds of best dry Venetian red. Mix well and then strain through a fine wire strainer. Use it when about the consistency of thin cream. Give the cement surface a coat of this, and after standing a day or so apply a coat of red lead and linseed oil paint. After this has dried you may paint the surface any color you wish. Some jobs require two coats of paint over the red lead paint. In this case make the second coat of paint serve as filler and paint both. This second coat may be made with plaster of paris and oil of the consistency of buttermilk. Then break up some white lead and oil to make a paint the same consistency as the plaster paint. Now take equal parts of each of the two mixtures and "box" them together and thin to a working consistency with turpentine. This second coat should be applied as heavy as possible, or as heavy as you can spread it well. After this coat is dry apply your next and finishing coat of paint, which should be quite glossy, or about as you would for the last coat on woodwork outside. The object in giving it this plaster paint is to prevent the running and wrinkling of the paint where considerable paint is to be applied to the surface. And it must be made to dry quickly.

* * *

A Town Built of Concrete

A serious fire recently visited Winthrop and within an hour two hotels and seven houses were completely destroyed. The progress of the fire in one direction was completely stopped by a concrete house which was just being finished, and which was not injured at all. The fire was so intense where this building stands that the granite curbing across the street was split and crumbled as if broken with sledge hammers. In view of the strength and fire-resisting properties of concrete, the new town of Concrete, Pembina County, N. D., proposes to stand by its name, and the townsite people refuse to sell lots except on the condition that concrete will be used in the construction of the buildings to be erected thereon.—Boston Transcript.



Automobile Built on Mission Furniture Lines



Entrance, Oakland Bank of Savings, Oakland, Cal.
C. W. Dickey, Architect



Fig. 1—Bonsall Bridge, San Diego County, Cal.

Flood-Proof Bridges in California

By H. C. MALOTT

CALIFORNIA streams are noted for their independence; if they cannot undermine the bridges that span their course, they form new channels and go around them. As a consequence many long trestles have been built of the cheapest material, to allow them as great latitude as possible in the selection of their channels. Unfortunately, the more latitude given them the more they take. California rivers can be controlled with little difficulty, however, when the reason for their behavior is fully understood. They are almost always of steep grades, with currents of high velocity in flood. The rapid flow scours out great quantities of the friable soil, which is carried in suspension until a point is reached where the velocity of flow happens to be less, and there deposited. This deposit fills the channel, still further retarding the flow, and thus still further increasing the deposits, and as the channel fills the current spreads over a greater width, which tends continually to still further decrease the flow and increase the deposits and widen the bed. Thus, once the deposit has started, the stream continues to widen, becoming more shallow, but spreading over a great width of constantly increasing sandy bed.

Nevertheless, if this flow of water could be confined to a narrow channel, the floods would scour it clean and carry the deposits to neighbors below who, perhaps, might have exercised less foresight. To confine such streams would be an extremely expensive proposition. But if, instead of building long trestles which permit the stream to meander at will, a flood-proof bridge be erected having sufficient waterway to carry all floods, and the approaches to such bridge be built of earth-fill sufficiently high to hold back the floods and force them through the bridge, a channel will be formed that will clear itself. Such an improvement need cost no more than a wooden trestle, and may be made permanent; for if the fill be built sufficiently high to withstand overflow, no flood will break it under ordinary conditions. Earth dikes are rarely broken by floods, except when overtopped by the flood.

If a channel be thus formed at the bridge, it will eat its way backward up the stream. This may seem anomalous, but it is a fact that a stream will rarely cut a channel downstream, the tendency being rather, on the contrary, to build up its bed when charged with material in solution. But let a channel be cut that permits the escape of the water below, and immediately the increased velocity of the water in its escape produces ravines leading into the outlet channel and cutting their way upstream. Thus, in an earthen dam even, a great head of water is held back and is unable to force a channel through the dam. But let a small stream trickle over the top and find a channel

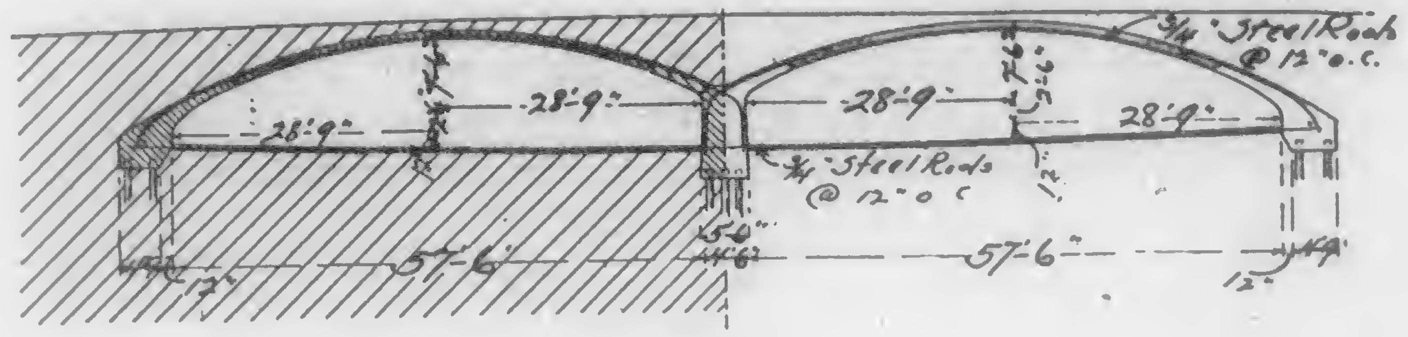


Fig. 2

of escape below, and almost immediately a gorge is formed that carries away the entire dam. Scoop out a shovelful of sand from a slightly submerged sand bar in a small stream and note how quickly the channels form leading into the depression.

If, at the same time that the velocity of the stream is increased above the bridge to cut a channel, its velocity can be decreased below the bridge, an additional advantage will be gained in that a less amount of scour will be carried to fields farther downstream.

Both of these ends are accomplished by concrete bridges recently erected in California and shown in the accompanying views.

Figure 1 is a view of Bonsall Bridge, in San Diego County, erected in 1907, for the Board of Supervisors by the National Bridge Company of Los Angeles. It consists of two concrete arches of 57 feet 6 inches span each and flood-proofed with a reinforced concrete pavement extending across the bed of the stream from abutment to abutment, as shown in section in Figure 2. This pavement is provided with aprons at both upstream and downstream edges, extending downward into the bed of the stream to prevent undermining. The upstream apron is carried but two or three feet down, as there is but little tendency to undermine such a pavement from above. Here again the stream works most havoc from below, and a deep apron is necessary at downstream end to prevent the rush of water, as it leaves the bridge, scouring back under the pavement. Such a bridge is flood-proof against the highest velocities of current. Hence it is possible to dam a river with earth approaches to such a bridge and thus force the current through the concrete arch under a head and at high velocity, without the least danger to the structure. This produces the constricted channel that will cut its way upstream from the bridge.



Fig. 3—Single Span Concrete Bridge in Santa Barbara County, Cal.

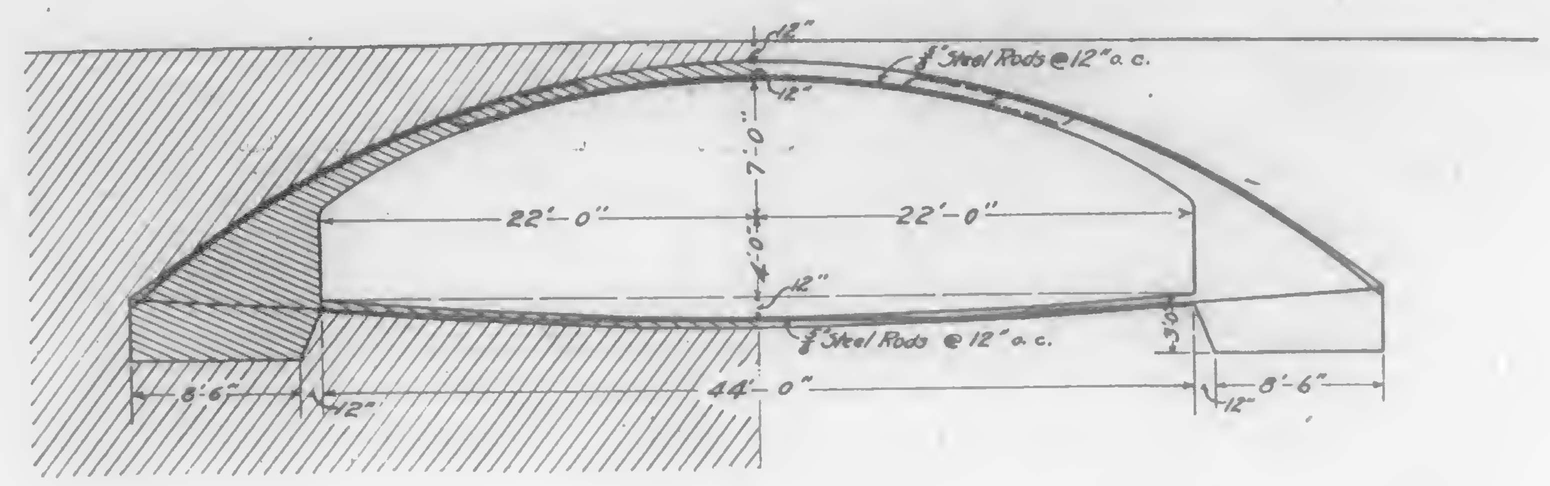


Fig. 4

The pavement prevents the bed of the stream from scouring deeper under the bridge, but immediately downstream from the pavement the rush of water will scour the bed to a lower level and a waterfall will be formed over the downstream apron of the structure. This waterfall breaks the velocity of the current and destroys its energy, preventing it from further scouring its bed below the structure. Instead of a steep channel of water rushing at high velocity and taking up its bed in its rush, the drop in the channel now occurs at the waterfall, doing no harm, provided the apron is sufficiently extended to prevent undermining of the pavement. And the stream flows away from the bridge, relieved of its load of earth in suspension and unable to again attain a velocity that will erode its bank—a conquered and pacified rivulet such as flow through the New England states.

The remedy for a swiftly flowing, eroding river is to break up its speed by introducing numerous waterfalls, and the bridge that will accomplish this is not only useful as a bridge for traffic, but is almost of primary importance in controlling floods.

A single-span bridge of forty-four foot span is shown in Figure 3, and in section in Figure 4. This bridge was erected in Santa Barbara County for the Board of Supervisors by the Atlantic, Gulf and Pacific Company of Los Angeles.

Another similar bridge, consisting of two sixty-five foot spans, was built the past year in Lake County by C. H. Gildersleeve, a contractor of Napa, Cal., for the Board of Supervisors of that county, and is shown in Figure 5, and in section in Figure 6.



Fig. 5—Two-Span Concrete Bridge in Lake County, Cal.

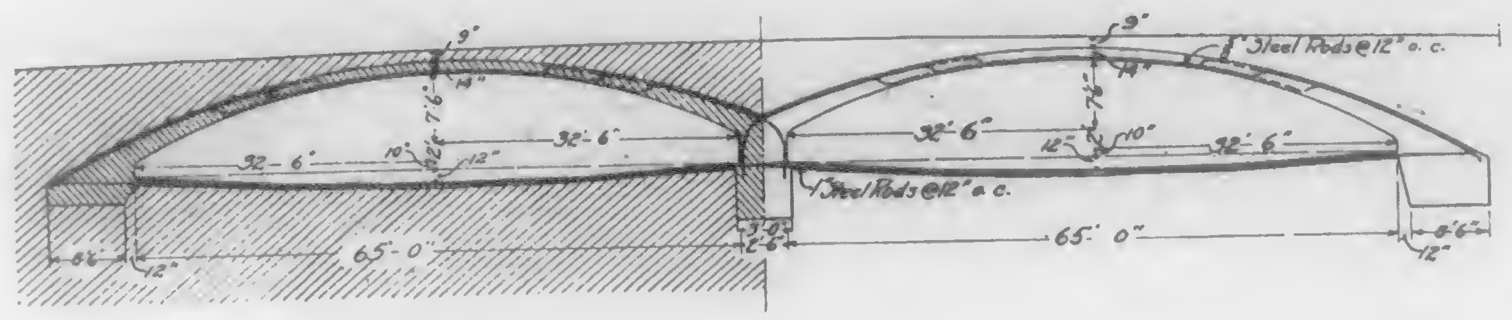


Fig. 6



A Twelve-Span Concrete Bridge

All of these bridges were flood-proofed with the concrete pavement described above. The bridges are reinforced with five-eighth or three-quarter inch steel rods spaced about twelve inches apart and arranged in a single series, yet crossing at alternate points to reinforce both inner and outer faces of the arch ring at the requisite regions. The arches are concreted in longitudinal rings which are bonded together with transverse rods embedded and extending upward into the spandrels to bond them to the arch. The face rings are concreted monolithically with the spandrels to avoid the unsightly joint on the face of the wall, sure to show a ragged edge discolored by seepage from the earth fill. The concrete pavement after placing in the bed of the stream not only renders the bridge flood-proof, but serves as a support for the falsework on which the arches are erected.

After the arches were concreted the earth fill was applied immediately and surfaced with the gravel roadway; centers were then struck when the concrete had set about twenty days; after removal of centers when the arches had become adjusted to the loading of earth fill, the concrete railings were added as the last step in the construction.

* * *

The Proper Tool to Use

Two Irishmen were passing by a jeweler's store that had a lot of unset precious stones in the window. They stopped and looked at them, when Pat said to Mike:

"How would you like to have your pick?"

"No," said Mike, "I would rather have me shovel."

* * *

What we don't know never hurts us half as much as what we think we know, but don't.

Public Should Boycott the Firetrap*

By RICHARD L. HUMPHREY, President of the National Association of Cement Users

IN OUR large cities are thousands of firetraps, any one of which may at any time cause a conflagration that will wipe out millions of dollars' worth of property and destroy the lives of many people.

Our villages and hamlets are for the most part a collection of firetraps. It is a crime to permit public assemblages above the first floor of any building which is not fireproof. It is a crime to have a public meeting place in any building that is not fireproof. The public should place a general boycott on all buildings that are known to be firetraps, especially those in which the public assemble.

In its mad rush toward a prosperity unparalleled in the history of civilization this nation has permitted abuses which are as startling to the outside world as has been our advancement. Our priceless heritage of natural resources has been squandered with a prodigality that threatens the exhaustion of many of them before the end of another century. The most serious is the depletion of our magnificent forests, which have been slashed and cut with such a ruthless hand that unless drastic measures are at once taken to save what remains and strive to replace what is already destroyed, by the replanting of trees, our supply, according to the opinion of the Federal forest service, will be exhausted in thirty-five years.

The greatest waste of timber is caused by fires, and the record of the United States is the most shameful of all the world.

In 1907 the property destroyed by fire amounted to the enormous total of $215,000,000, a per capita loss of $2.51. Of this loss $146,000,000 was in frame buildings and but $68,000,000 in brick and stone. This terrible waste is not equaled by any other nation.

Our per capita is nearly eight times that of Europe, which is reported by the National Board of Fire Underwriters as but 33 cents for six leading countries. Under similar conditions the fire loss in this country for 1907 would have been but $27,000,000, and $187,000 would have been saved. Nor is this all. The United States has the finest and most efficient fire-fighting apparatus and private fire-protection system in the world. Eliminating the loss through property destroyed in fires, the cost of fire protection for 1907 amounted to $241,401,442. There was paid to insurance companies, in excess of what they returned as losses $145,000,000; the fire departments cost fully $50,000,000 and private protection systems $18,000,000. Altogether the total cost of fires in the United States during 1907 amounted to $456,486,151, or $5.34 per capita, or nearly one-half the cost of new building construction for the same year, estimated at $1,000,000,000.

Confronted by such startling figures, we naturally look for the cause, and it is easy to find. This country is filled with buildings so faultily and flimsily constructed that they are a constant menace.

The people of Cleveland have had one fearful lesson in the past year in the burning of the Collinwood schoolhouse, in which the lives of more than 150 little children were lost. While this may be charged up to bad construction, those responsible for the conditions which permit such structures to exist and to be occupied for such purposes should be criminally liable.

One year ago another frightful object lesson was afforded in the fire which destroyed the Boyertown (Pa.) opera house and resulted in the death of nearly 200 women and children who were unable to escape.

* Extract of address delivered at the annual convention of the National Association of Cement Users held at Cleveland, Ohio.

Instead of profiting by these awful experiences, as would naturally be supposed, the country, after the horror of the disaster has ceased to attract attention, lapses into an indifference which can only be removed by another similar disaster.

Scattered all over this country are Collinwood schoolhouses and Boyertown opera houses, and these disasters will recur until these buildings are removed and our methods of construction are changed.

In 1906, according to the census authorities, more than 5,000 persons died from burns in this country.

Deplorable as is the needless and criminal loss of life in fires, there is another phase of the question that is most serious—the enormous drain on our natural resources resulting from the annual destruction of millions of dollars' worth of property by fire, which is not possible under European standards. Last April a conflagration at Chelsea, Mass., resulted in an insurance loss of more than $8,000,000. Such conflagrations are possible in practically every big city in the country. The Fire Marshal of Ohio, Mr. D. S. Creamer, states in his annual report for 1907 "that a conflagration costing $300,000,000 is entirely possible at any time in this city of Cleveland and in your sister city, Cincinnati."

These conditions are often attributed to a desire on the part of property owners to erect their buildings as cheaply as possible in order to obtain the highest return from their investment. While this may be true in some cases, I think the real reason is that we have not as yet outgrown our primitive conditions which necessarily prevail in newly settled countries. Proper, conservative and safe building laws are the result of years of experience, and that is why Europe shows up to such advantage when compared to this country.

While our building knowledge has hardly developed into a science, we are learning rapidly the methods and materials necessary to secure the safety desired. The American people are not slow in adopting improvements when once their value is established. In the last few years we have made wonderful strides toward better construction, under the helpful guidance of the United States Government. For many years the Federal officials have realized the seriousness of these conditions and the utter lack of knowledge concerning the properties of building materials. With the Government spending $40,000,000 annually in the construction of public works, it was found necessary to inaugurate an elaborate series of experiments in order that the money could be expended wisely, for the Government does not insure its buildings, but rather strives to make them fireproof.

The task of finding out the best materials for such structures was assigned several years ago to the Technologic branch of the United States Geological Survey, under the direction of Dr. Joseph A. Holmes, expert in charge. These experiments have continued up to the present time, and although they have been conducted primarily in behalf of the Government, the results have been given freely to builders, engineers, architects and the public generally.

In the revision of the building laws of the country the progress has been extremely slow for the reason that a certain inertia must be overcome in removing the prejudice against changing existing laws. The influence of various interests opposed to this revision for commercial reasons has been another factor in preventing the adoption of better laws. Adequate laws are the first essential in bringing about the conditions that will prevent the big annual fire losses. Laws must be enacted that will not only regulate new construction, but that will invest in the building authorities the right to condemn structures whose very existence is a menace to public safety.

This is especially true in great cities like New York where the presence of innumerable firetraps is a constant danger which, unless eliminated, may some day result in a conflagration that will sweep the city. Laws, no matter how perfect they may be, can be of no real value unless they are rigidly enforced. Many existing laws, if enforced, would prevent the erection of not a few dangerous structures.

The most potent influence in the attainment of buildings in which public safety is properly cared for lies with the people. If every one could be brought to a full realization of the dangers due to faulty construction, they would soon bring about a reform in methods that would result in permanent progress. It is the duty of the people to demand buildings of the highest fire-resistive type in which to live and work, in which their children may go to school, in which the sick and helpless may be cared for, and in which the people may be amused.

If the public would refuse to make use of a building known to be a firetrap they would apply an effective remedy.

* * *

The Return of the White Enamel Finish

THERE are doubtless many who remember when a white enamel finish was the only proper thing for a parlor or drawing room, and what is more beautiful for a decoration than white? It strikes a note of perfect taste and from a decorative point of view, there is nothing to equal it for pure beauty and daintiness.

The reason, no doubt, it was abandoned as a finish was the fact that in those days enamel was imperfectly made and sometimes turned yellow, and what is more depressing than a white enamel deteriorated into a yellow?

But now that there are enamels that will not turn yellow, high class decoration is synonymous with "enamel finish." In England especially and on the European continent generally is this true.

Architects enhance and preserve the beauty of their creations by specifying a tried enamel for their decorations. By far the most favored finish is a snow white enamel. Many European palaces and thousands of the best homes are decorated in this manner, and in such places as Monte Carlo and the south of France, where elegance is of first consideration, white enamel is the thing.

The great railways and steamship companies are large users of it. The Mauretania and the Lusitania, the largest, fastest and most elegant ships afloat on any sea are largely finished with this now favored finish.

The London and New York hotels of recent construction are all following this trend. Its use in the Savoy, Carlton, Langham and Ritz in London, and the Knickerbocker hotel, Hotel Astor, Waldorf-Astoria, together with many other New York hotels are indisputable evidence that white enamel has returned to stay.

* * *

In Milwaukee, a permit is necessary in order to construct an overhanging bay window upon a business street. These permits are largely a matter of form and the council has seldom if ever refused them. But it has been concluded to require them in advance and arrests are promised any who attempt to erect a bay window or sidewalk canopy without securing permission in advance.

* * *

The indications are that the production of ore on the ranges of Northern Minnesota will soon be upon the high level which has obtained in former seasons, an indication of good prospects for the demand for iron and steel work for another season.

San Francisco Architect Writes of His European Observations

CHARLES EDWARD HODGES, who was formerly resident architect at Stanford University, writes from his former home in London, after a tour of the continent, in the following interesting vein:

"I can but give you a very brief synopsis of my trip, and therefore will refer principally to that portion of it in which I visited some of the principal cities of Italy, among them Rome, but not like the old adage, "to see Rome and die," but to live again, and try to reproduce the grand old masterpieces that I firmly believe can never be duplicated either in design, planning or workmanship.

"The route that I selected led me to Paris, Turin, Genoa, Pisa, Rome, Florence, Venice, Milan, Lucerne and Paris. From an architectural point of view, Pisa is very interesting, and among its principal features are the famous Leaning Tower, Cathedral and Baptistry. The Tower, 256 feet high, which I ascended, is wonderful in its construction, being fourteen feet out of plumb, and beautiful in its architecture, the material being white Italian marble, corresponding with the two remaining buildings. "Report" states that this Tower is slowly settling, but a close investigation gives no apparent cause for the statement. It was erected for a watch tower, the big bells still being rung, and from the top of which a fine view of the city, with its old Roman wall, can be obtained. The Cathedral is a beautiful edifice, and the interior, with its marble walls, columns and fine paintings, render it nearly unequalled. The exquisitely carved Corinthian capitols were found B. C., and presumably brought from Rome.

"The Baptistry, outside of its exterior architectural grandeur, is noted for its wonderful acoustic properties. I stayed in Rome eight days, taking a lecture tour of four days under Dr. Winslow Forbes, a celebrated archeologist, who has lived in Rome for the last thirty-five years. It is a well laid out city, the Corso Umberto, the principal thoroughfare, running through the center from the Porta del Popolo, the main entrance in the old Roman wall. Very fine statues and monuments mark the numerous fine squares or 'piazzas.' Old Rome I refer to, before the earthquake and fire of A. D. 192, is now being excavated, portions of which I visited and you can see the ruins of dwellings and other edifices. In rebuilding they did not clear away the ruins of the older houses, but filled in and built over them. The mosaic pavements of this period cannot be excelled in workmanship and design by the artisans of today. The travertine stone, first brought from Tivoli, began to be used about 100 B. C., the brick walls having veneered stonework, and where the stonework was solid no mortar was used, but the stones were clamped together.

"In the house of Julius Ceasar the terra cotta hot air pipes are still to be seen, and in the heating chambers these pipes have been collected. Also a piece of a lead pipe, and remains of a flight of stairs leading to the upper floors. The marvelously built brickwork is stamped with the second, third and fourth centuries.

"The Colosseum cannot be better described than as the celebrated author, Byron, states: 'A noble wreck in ruinous perfection,' for in its planning it must certainly rank with the leading modern halls. Begun in A. D. 72, and finished in A. D. 80, it shows today the wonderful workmanship and material of which it is composed, and its 1900 feet of circumference still remains, not despoiled of its grandeur by time, but by ruthless hands, the erection of the more modern palaces, and was the general quarry ground.

"The Palatine Hill, the excavations of which show that here were assembled the magnificent building of the Roman princes, for here may yet be seen beautiful frescoed walls of the various palaces.

"The Forum adjoins the Palatine, built by Augustus and restored by Emperor Hadrian, who, judging by the remains of his home and grounds at Tivoli, must have been a great artist and skilled architect. Three beautiful Corinthian columns and domed roof of the vestibule of the temple Mars Ultor, still stand as a memento to his genius. So much can be written, even by so poor a pen as mine, that I am afraid I may weary you with the enthusiasm which these grand old ruins of a prehistoric race aroused in me, so I will only touch upon the Pantheon and St. Peter's. The former, built by Agrippa, is circular in form, and was originally used as a bath house, and afterwards dedicated as a temple to the Gods.

"The portico is noted for its wonderful symmetry and proportion, and has sixteen Corinthian columns supporting the roof.

"The interior is 142 feet in diameter, and 143 feet high, with a concrete domed roof, lighted at the top only by a circular open space 28 feet in diameter.

"St. Peter's is a majestic structure on the exterior, but the interior left me with a very dissatisfied opinion as to its artistic beauty and grandeur. St. Paul's, supposed to be its half brother, is, in my opinion, far more impressive in its interior grandeur, and it only lacks the colossal and grand approach which favors St. Peter's.

"The galleries and museums of Italy have been and are the wonder of the world, and here may be seen the originals of masterpieces in statuary and paintings which will never be excelled, and I reveled in the wonderful works revealed in the Ufizzi and Pitte galleries of Florence.

"In Venice I was royally treated by my friends, having the use of their gondola and an experienced guide during the three days of my stay, and in the Palace of the Doges discovered architectural wonders in the carved capitals of which decency forbids me to make further comment, but to the Italian all things are pure.

"Venice is a city of bygone splendor and sentimentalism, for it is hard to place the celebrated troubadour, with the tooting of the little steamboats which now ply on the Grand Canal, although the gondola still has its way in its crowded thoroughfares. The Grand Canal, opening onto the Adriatic and surrounded by beautiful buildings, struck me, seated in hotel omnibus (gondola), with the moon just disappearing behind the domes of St. Marco, as one of the most beautiful cities I had visited. It was only by daylight, when I discovered that the fine palaces which we had passed are now being used for warehouses, that I awoke to a realization that the sentiment had gone."

[Since the above was written Mr. Hodges has returned to San Francisco and again taken up the practice of architecture.—Ed.]

* * *

"Ah, that's pretty!" said Mr. Snooks, looking over a number of architectural designs. "What is that?"

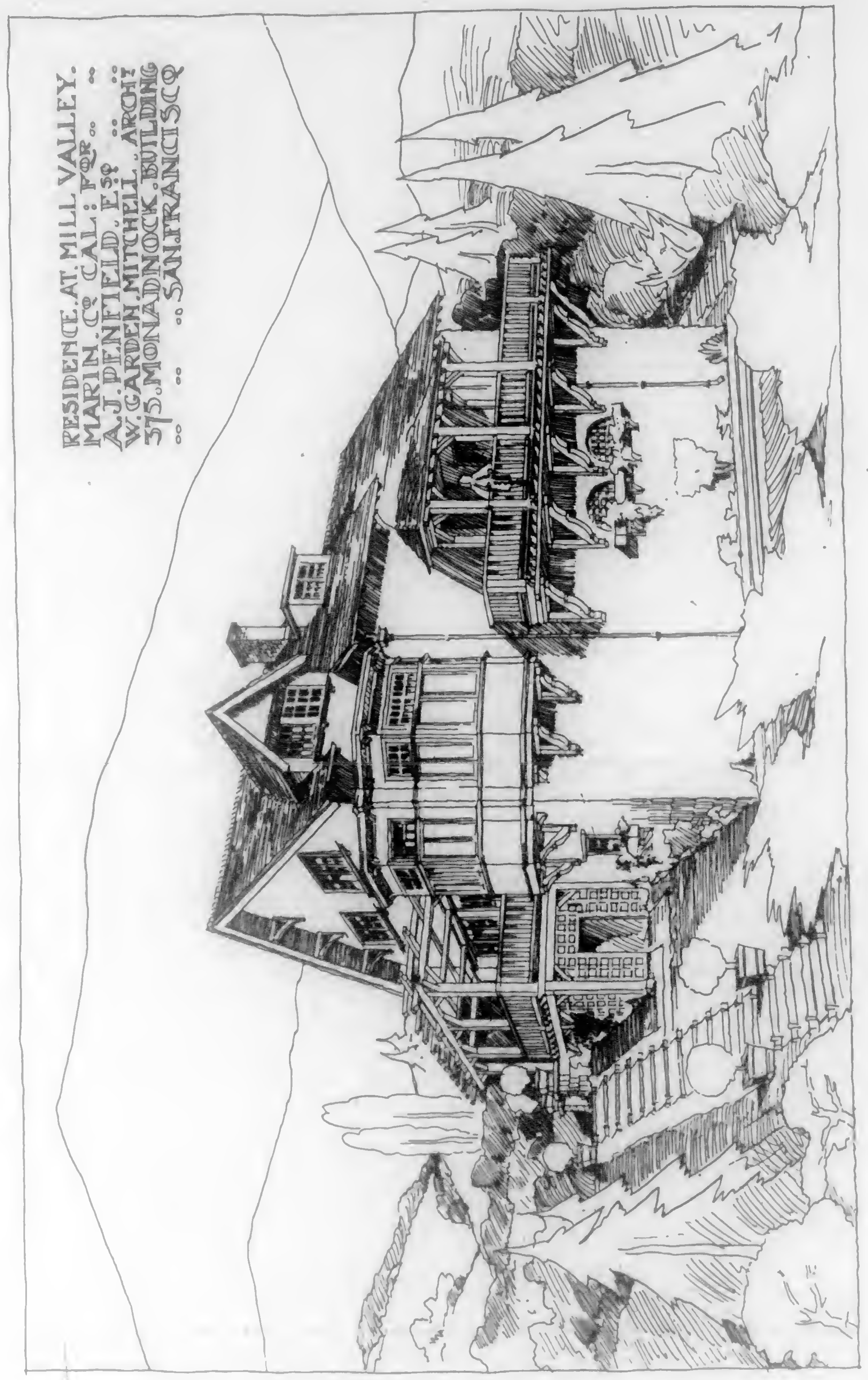
"That," said the architect, "is a $1500 bungalow."

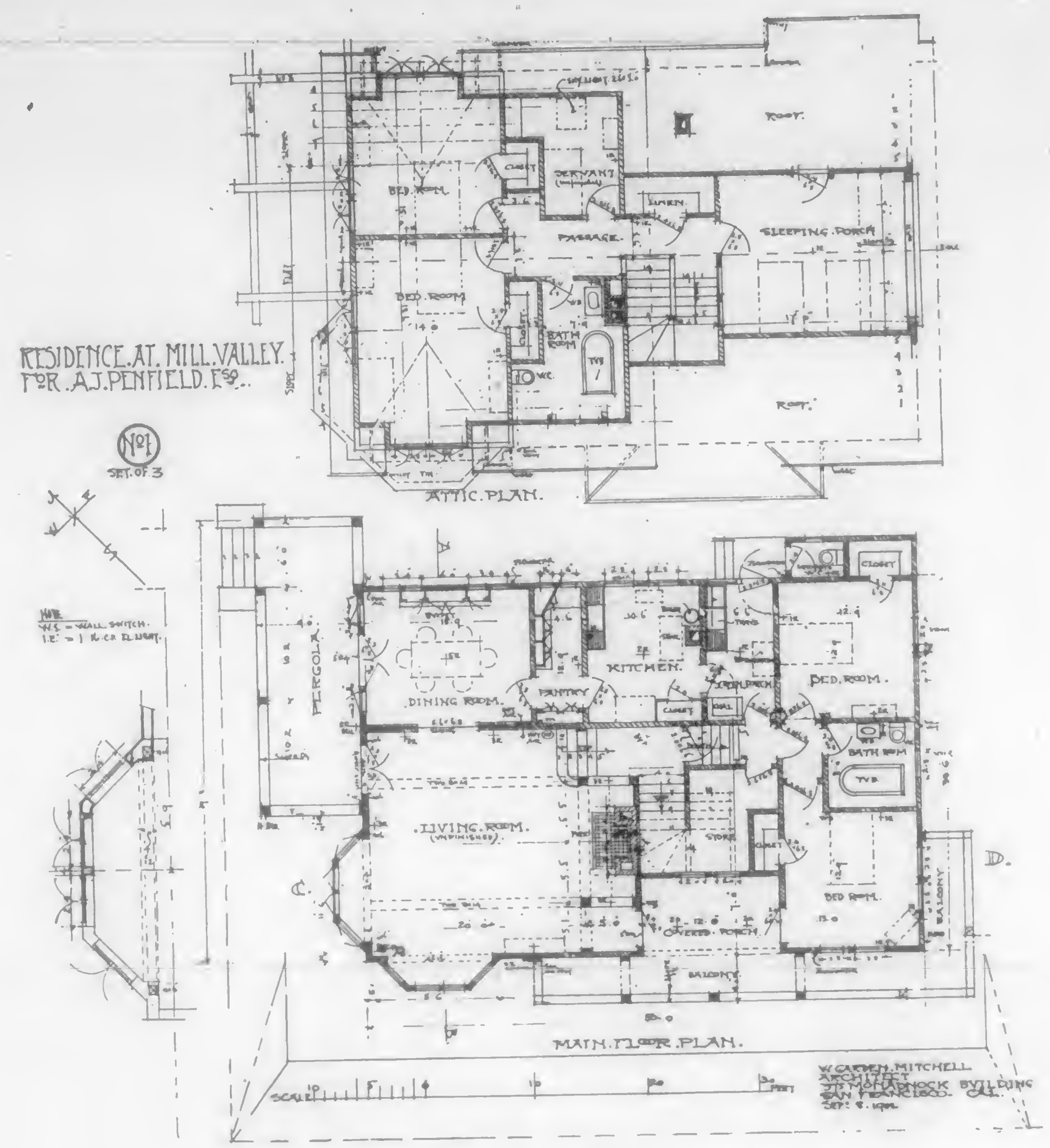
"What will it cost to build it?" asked Mr. Snooks.

"About $8000," said the architect.—Judge's Library.

* * *

Following the ideas of others may help you some, but it is only when you begin to generate ideas of your own and follow them that you are in line to amount to something.

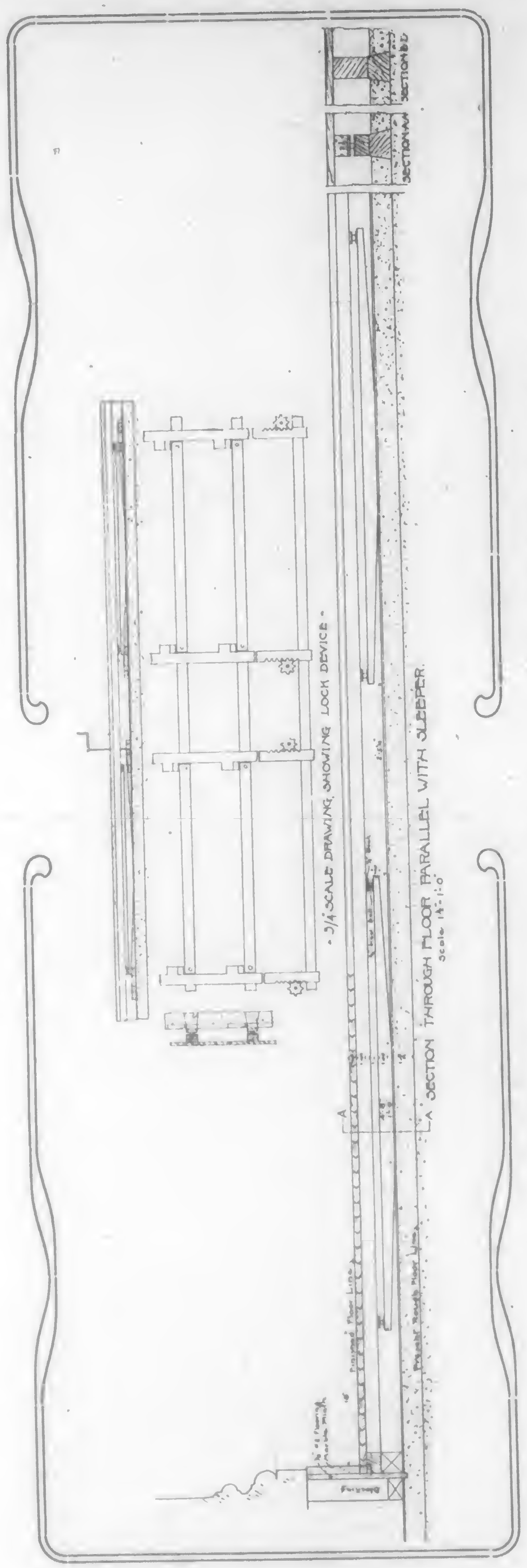




The Penfield Residence

By W. GARDEN MITCHELL, Architect.

IN Mill Valley nature has arranged the setting for habitations in such varied and marvelous beauty, that it remains only for us to choose the vantage point and place our lines of vision so that from early dawn to latest twilight, we may enjoy the glorious sunshine and none less splendid shadows that circle 'round the magic peak. As the magnetic north draws the mariner's needle to the center, so Tamalpais, draws to its ponderous sides and disdainful summit every eye of the nature loving soul. It is a symbol writ against the sky; at daybreak action, at the mid hour strength, and at night repose. The house illustrated has endeavored in the sleeping porch to catch the first rays of dawn, at the midday hour to find warmth in winter, and cool in summer. From the reception rooms to have as vista the peak of Tamalpais and the deep shadows of the cañons crouching at its eastern base and while living as a part of nature in this magic vale, at the same time not to overlook the fact that we eat and sleep, seek the shade in summer and the fire and sunlight in winter. In other words adjusting ourselves to conditions that we may enjoy but cannot control. We as a part of nature and the house a part of us.



A SWINGING FLOOR IN THE ST. FRANCIS HOTEL

ARCHITECTS and engineers are taking keen interest in the results that are being had with a patent elastic floor—the only one of the kind on the Pacific Coast—in the ball room of the St. Francis hotel. Messrs. Bliss and Faville, the architects, are receiving many words of congratulation, as is the patentee, Mr. Chas. R. Hunt of Sacramento, as thus far the device has given splendid results. The floor is so constructed that it will yield to the slightest pressure, thus relieving fatigue and soreness in dancing, which a rigid support will not give. These results, while due to the resiliency or elasticity of the floor, are gained in practice not so much by a general yielding of the aggregate weight placed upon it, as by such a construction as distributes the elasticity over the whole floor in such a manner that the weight of each component of the company, whether single, in couples or in groups, should be sufficient to effect and produce the elasticity at any given area. The construction of the floor comprises fixed joists springs secured on the joists and fashioned with oppositely-extending resilient arms, balls freely seated in the arms of the springs, a floor surface supported on the balls, movable strips supported on and across the joists, and blocks on the strips adapted to pass under the spring-arms to lock them against resilient movement. The floor may be made elastic or perfectly rigid, as occasion may demand; this feature of the invention being particularly adapted to private houses, where the elastic floor would be used only for dancing.

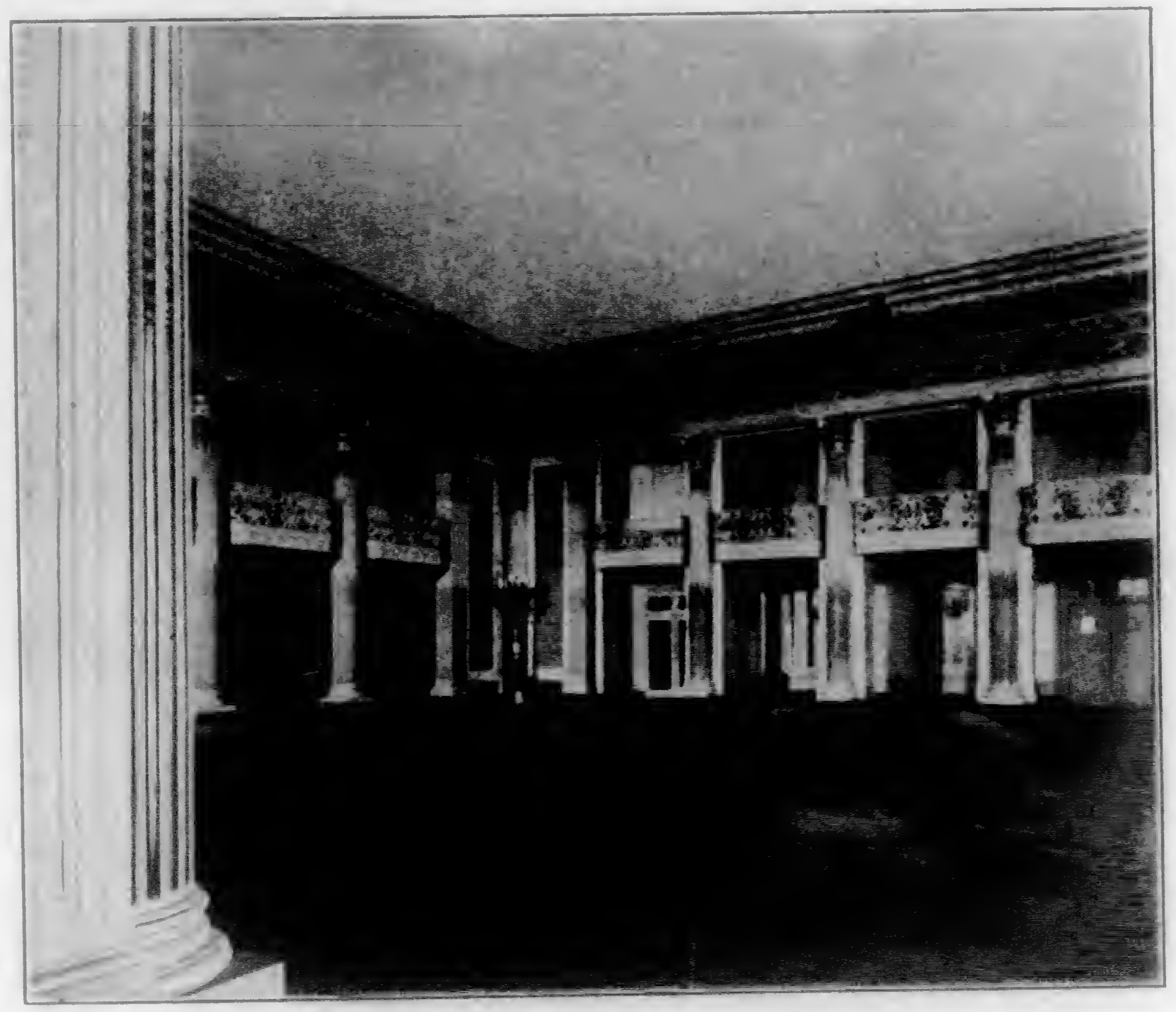
The Interior Decorative Features of the Hotel St. Francis

By C. WALTER TOZER

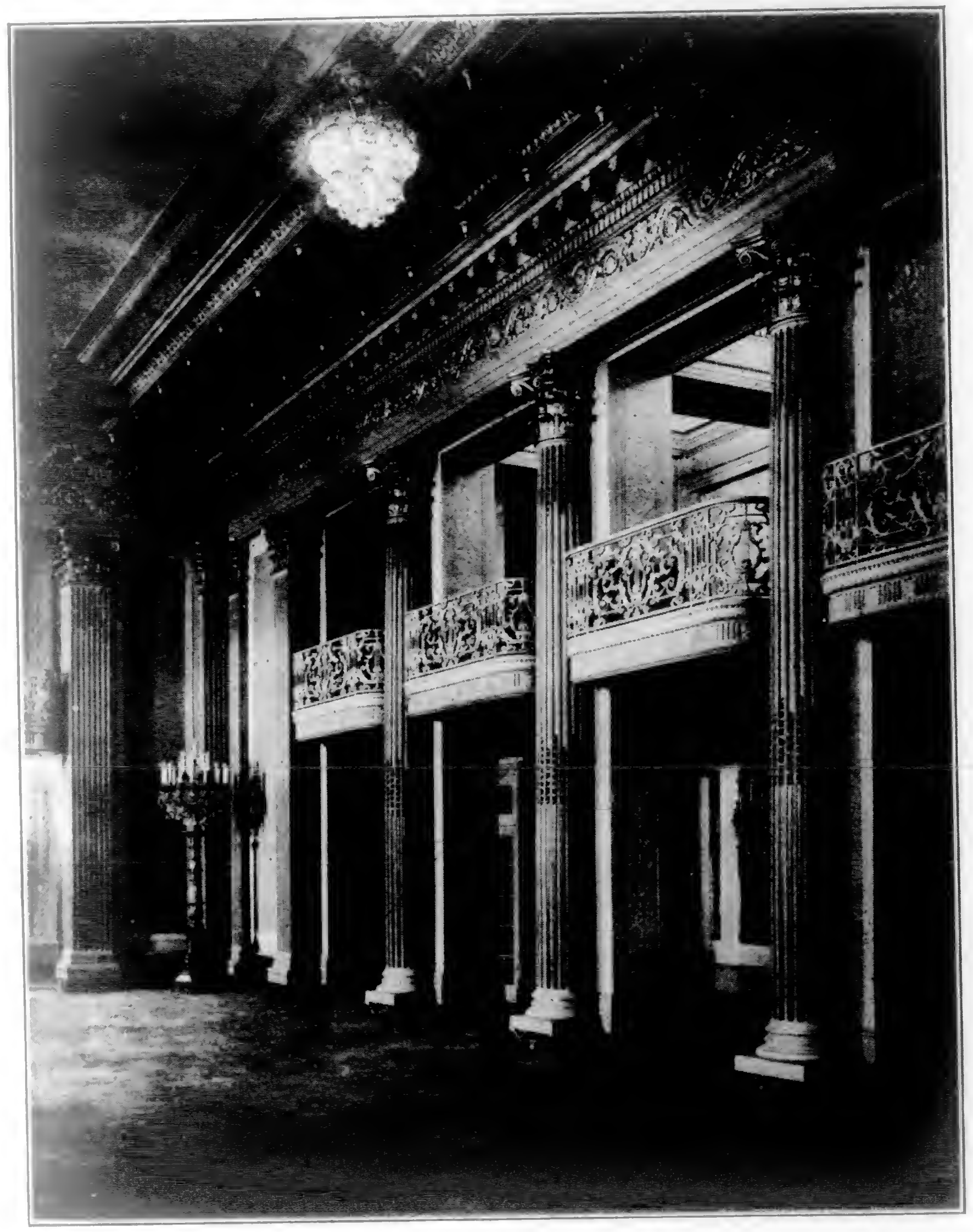
THE rehabilitated Hotel St. Francis, the first big San Francisco hostelry to reopen after the great fire of 1906, speaks eloquently for the architects, Bliss & Faville, and for its builders, Mahony Bros. After having gone through a fire that destroyed completely the entire business section of San Francisco and consumed the furniture of the hotel and all its interior fittings, the structure itself was absolutely uninjured by the earthquake or fire. Just nineteen months after the disaster, on November 30, 1907, the restored hotel opened its doors to the public with the two original wings fully completed and four hundred and fifty rooms ready for occupancy.

The building, of granite and gray sandstone, follows the style of the Italian Renaissance, and occupies an ideal location on Union Square, noted among travelers the world over as the garden spot of San Francisco.

Entering the hotel by the main entrance, the lobby presents an impressive appearance, with heavy coffered ceiling, supported by immense columns and pilasters of verde antique scagliola, with Corinthian caps finished in solid gold. The wall spaces are divided into panels, the field being of gold leaf, glazed over in copper-tone and bordered by Sienna scagliola. On the south side of the lobby, directly opposite the main office of the hotel, is an immense fireplace of verde antique marble. The wall space above this mantel will carry a painting of a California mission. This will be executed by Rollo Peters, a California artist, who has achieved an enviable reputation for canvases on these subjects. A mezzanine gallery runs the



Colonial Ballroom, St. Francis Hotel, San Francisco
Bliss & Faville, Architects



Corner of Ball Room, St. Francis Hotel, San Francisco
Bliss & Faville, Architects



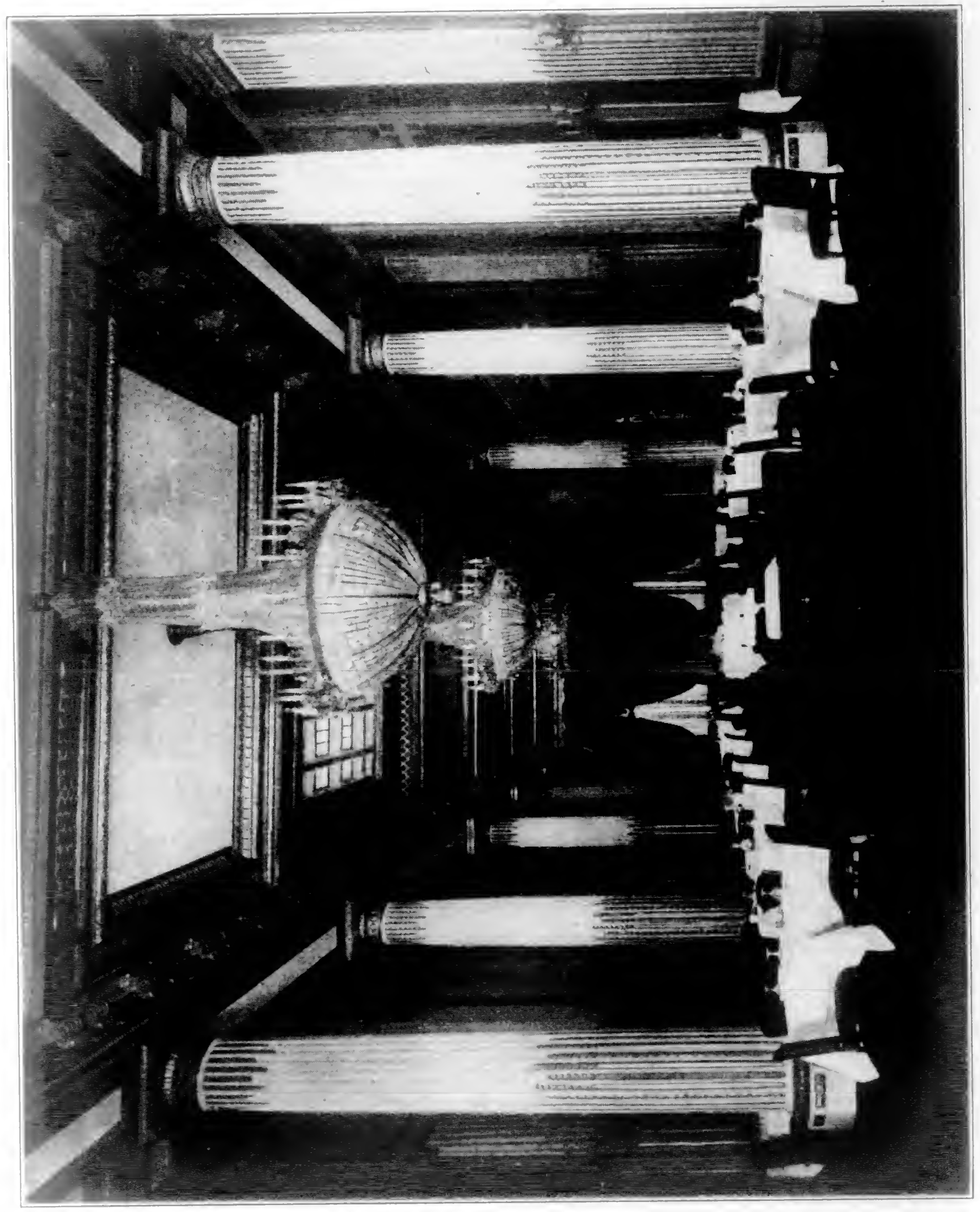
Sketch of St. Francis Hotel as it will Appear When the Annex is Completed
Bliss & Faville, Architects



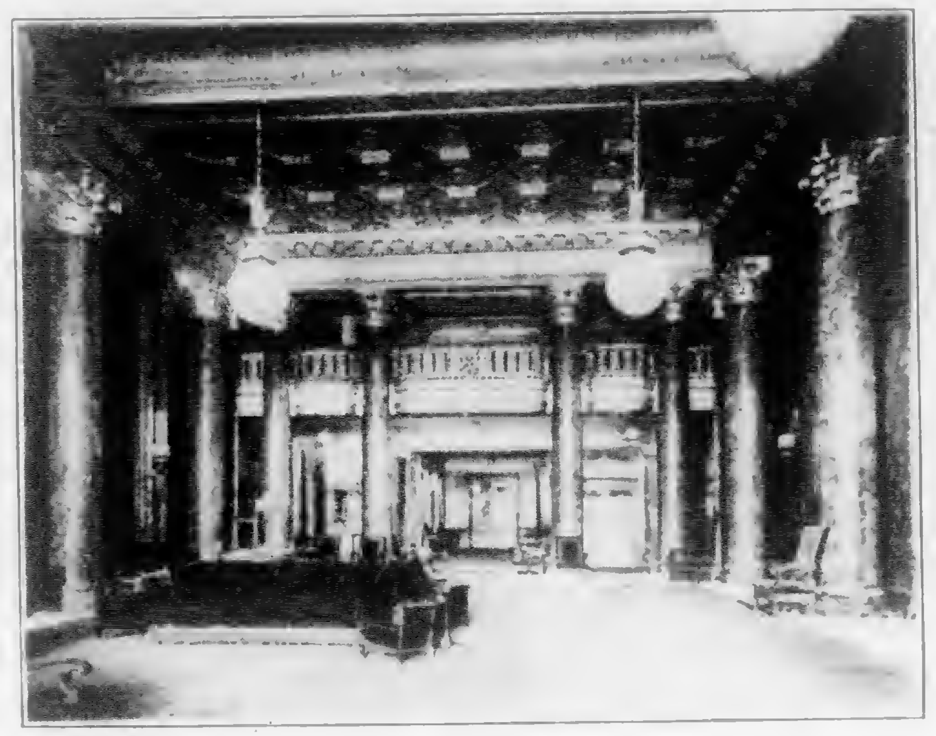
Corner of Ball Room, St. Francis Hotel, San Francisco
Bliss & Faville, Architects



Sketch of St. Francis Hotel as it will Appear When the Annex is Completed
Bliss & Faville, Architects



Dining Room, St. Francis Hotel. Bliss & Faville, Architects



White and Gold Room, St. Francis Hotel

entire width of the lobby on the west side, and completely overlooks the lobby. The floor is of slabs of light Tennessee marble. Large, specially woven, red Austrian rugs are evenly distributed upon the floor, balancing the area nicely. The furniture here is of massive design in mahogany, upholstered in red velours, each piece being a reproduction of museum examples.

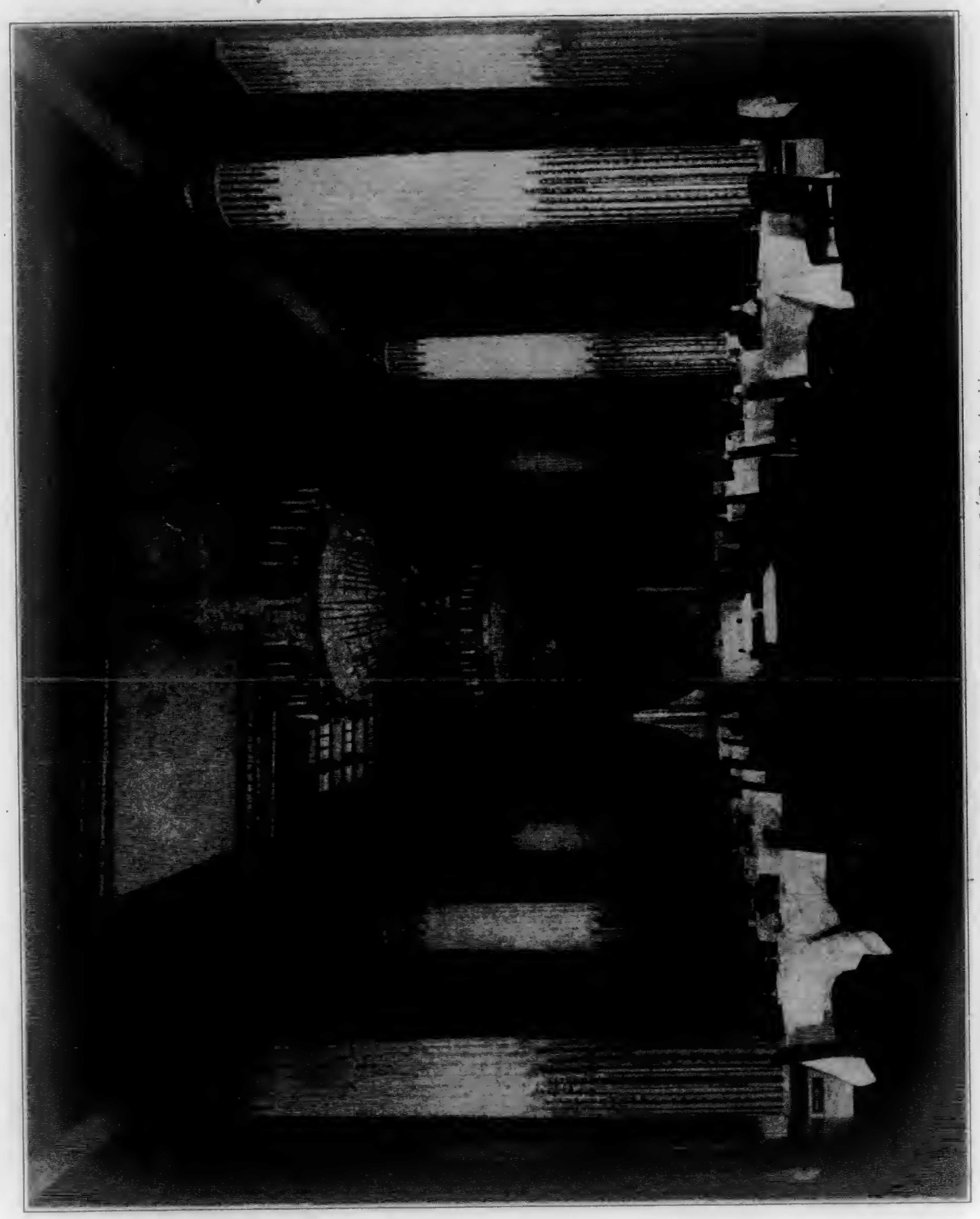
Continuing on through the lobby and under the mezzanine gallery, one passes into the main dining room. This room occupies a space one hundred and twenty-seven feet by thirty-five feet and follows the French Renaissance style. The length covers the entire width of the south and middle wings. It is considered one of the finest hotel dining rooms in America. The color scheme is gray and gold. All the woodwork and flat plaster surfaces are painted gray and all the ornamentation is grayed gold. The floor is entirely covered with a heavy pile red wilton carpet. The hangings and upholstering are also red. Immense crystal chandeliers and crystal bracket lights furnish the artificial lighting.

The reception room, immediately to the right of the main entrance, is most pleasingly treated throughout. The walls are paneled in Circassian walnut, each panel being beautifully grained. The furniture is also of Circassian walnut upholstered in antique rose velours, each piece being a reproduction of originals in European museums. The floor is covered with a one-piece rug in exactly the same tone as the upholstery and hangings.

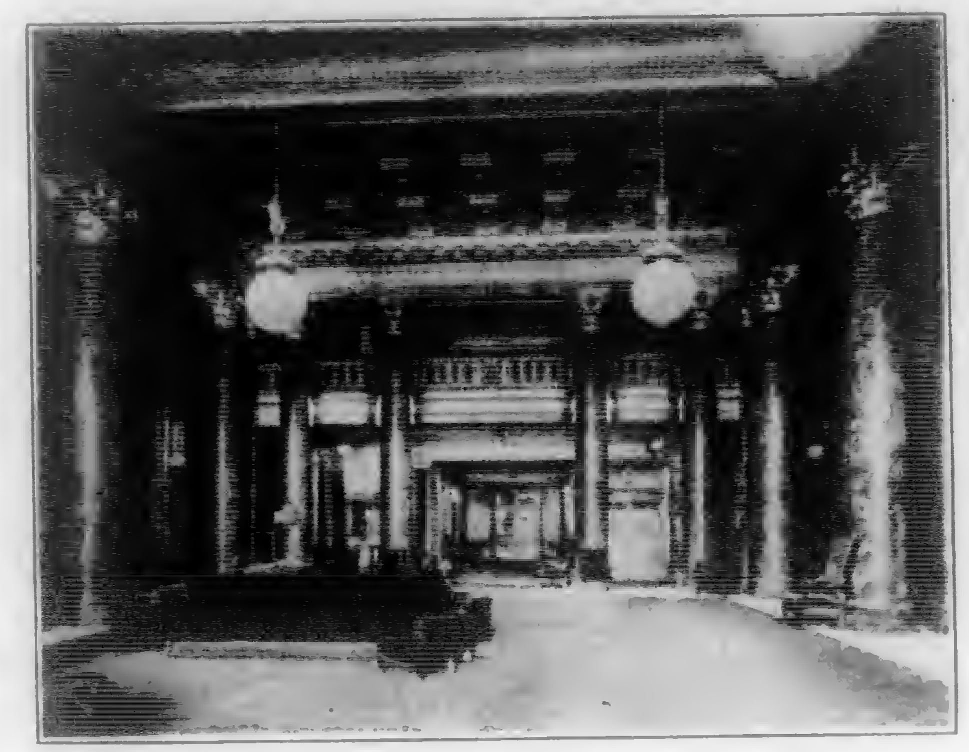
The cafe, on the main floor, and to the left of the lobby, is one of the most pleasing rooms of the hotel. The south and east sides of the room face Geary and Powell streets, respectively, so that these areas are almost entirely taken up by high, oval top windows. The other two sides of the room are paneled off with mirrors. Large columns and pilasters of Flemish oak support the ceiling, which is most beautifully beamed. In fact, this ceiling received its inspiration in the Chateau Brissac in France. All the ornamentation is here done in antique gold. Large crystal balls, hung by chains, from the center of each ceiling panel, augmented by beautifully designed bracket lights, supply the illumination. A highly decorative feature



Electric Grill, St. Francis Hotel



Dining Room, St. Francis Hotel. Bliss & Faville, Architects



White and Gold Room, St. Francis Hotel

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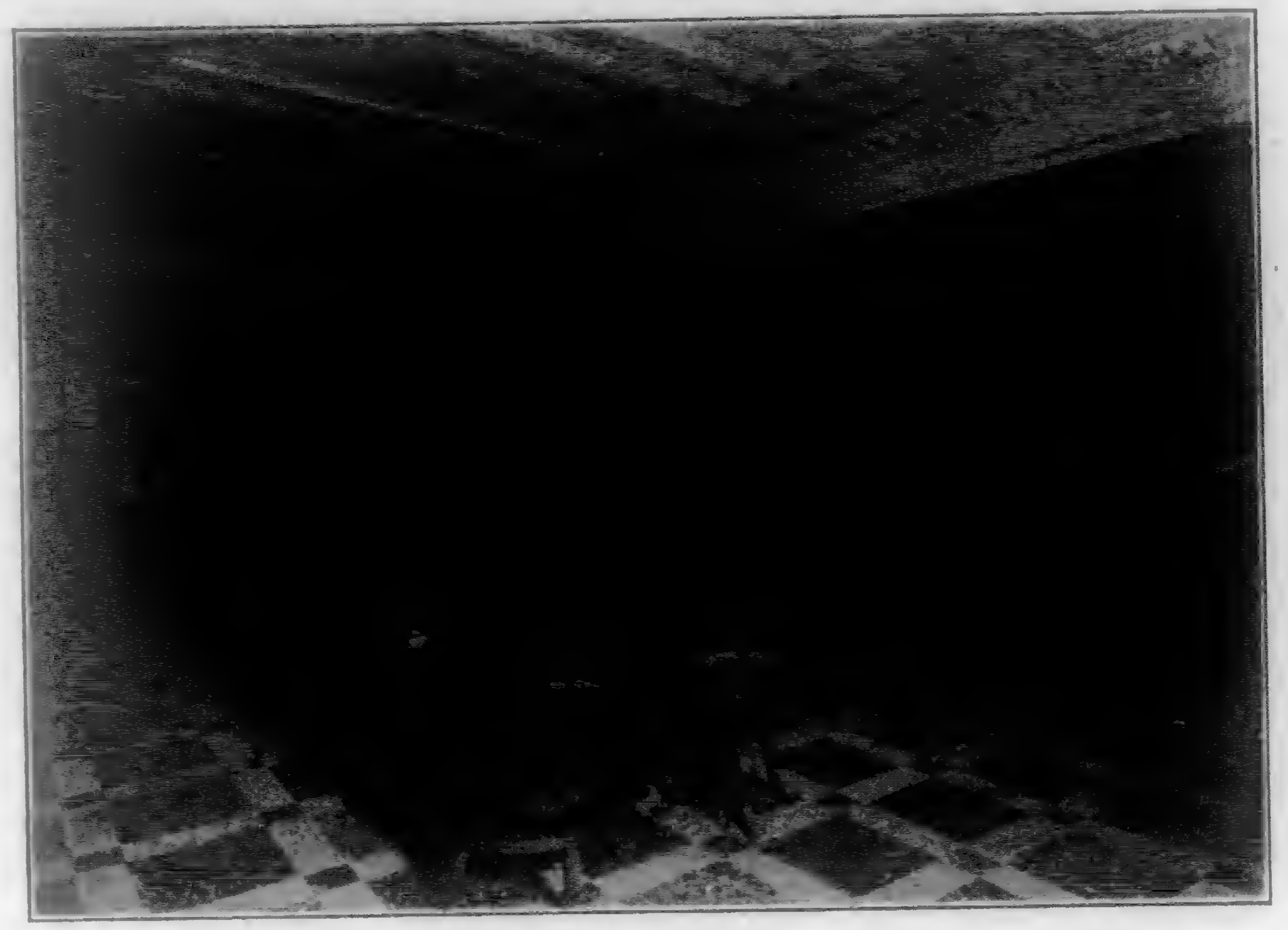
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Electric Grill St. Francis Hotel

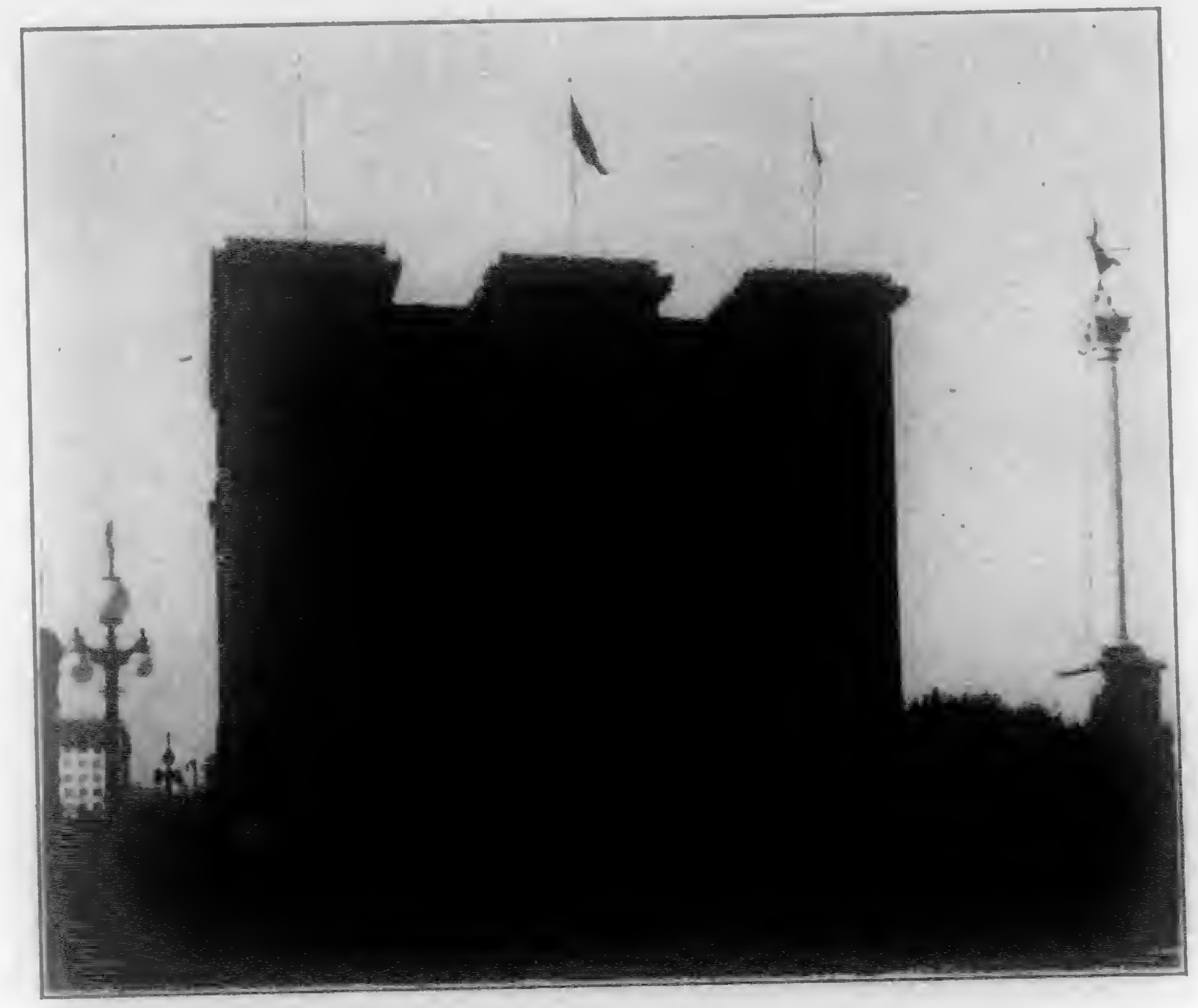


The Club Room
Sculpture by Arthur Putnam

of this room is the introduction of huge baskets carrying a wealth of greens, depending from the ceiling. The hangings are of green silk and the chairs are upholstered in green leather. This floor is also of light Tennessee marble blocks, and has runners of plain green wilton carpet.

At the extreme north end of the corridor, which opens from the main lobby, is the club room. This room combines many attractive features. The walls are all paneled in mahogany in Elizabethan style, but the wood is all grayed. The ceiling here is remarkable. It is paneled in natural ash slightly grayed and upon all the flat surfaces stencil designs are worked out, giving an imitation of inlaid work. The execution is splendid and it is only upon the closest inspection that the imitation can be detected. The west end carries a large Italian mantelpiece. This is made of beautifully carved Tennessee marble and is finished in a wax process which gives the marble an old-world aspect. Large mirrors, framed in grayed gold, make up the back bar. The floor of the club room is of red Moravian tiles. Comfortable settees, upholstered with leather, are built in the walls on the south side of the room.

Directly across the corridor, and occupying the entire width of the north wing, facing Union Square, is the tapestry room, now in course of completion. This room, when completed, will be one of the most interesting halls in the world. The walls will be decorated by a series of large panels designed by Arthur Matthews, dean of Mark Hopkins Institute of Art, the foremost draughtsman of the West, and one of the few great mural decorators in America. These designs will be reproduced in tapestries by the Gobelin craftsmen in Europe. The subjects will represent the march of civilization westward. The floor is of Tennessee marble and all the trim as well as the immense fireplace, will be of the same material. The ceiling is heavily beamed and when decorated will be the finest ceiling of any hotel in America or Europe. The furniture of this room has all been made specially to order and some of the very finest museum pieces have been perfectly reproduced. The center of the room will have a large table, copied



St. Francis Hotel, San Francisco, as it Looks Today
Bliss & Faville, Architects *Equipped with Otis Elevators*

from one in an ancient Roman hall, and on which will be carried a veritable bank of flowers. This room will represent an outlay of $175,000.

The electric grill, in the lower part of the south wing, also has many unique features. This room is treated as an old Dutch room, the walls being of oak, from floor to ceiling. The oak has been treated in a new method. It has been subjected to a powerful sand blast that eliminates all the soft fiber and leaves a rugged indurated surface that is very beautiful. The wood is left in the natural color, only having been filled. The ceiling is beamed, and each beam carries stenciled designs in antique red and blue colorings. The ornamentation on the columns are also picked out in the same colorings. A most unique hooded Caen stone fireplace is found in this room. It extends from the floor to the ceiling. The floor is unusual, being made of small, hexagon red tiles. The electric grill itself is a distinct feature. This is, I believe, the only electric grill outside of New York. One can have a steak cooked by it in five minutes and an English chop in seven minutes.

The Colonial ball room, which has but recently been opened, is a very attractive room. It follows the Italian Renaissance and is softly toned in ivory, with a suggestion of soft blue. This room is on the mezzanine floor and can be used en suite with a series of reception rooms. The dancing floor, 56x76 feet, is made of black walnut, with ball bearings, laid upon elastic second growth ash. Around three sides of the dancing floor is a promenade along which guests may walk without crossing the dancing floor, and above this promenade a balcony carries boxes and loges. The electric fixtures in this room are the finest examples of rock crystal in the West. The room is very brilliantly illuminated by large chandeliers, and

exquisitely detailed bracket lights set against mirrored panels. In addition to these, large standards in each corner of the room are also used.

There are four rooms on the mezzanine floor to be used as private dining or reecption rooms, the walls of which are covered with damask, one in green and three in red. The walls of the two banquet rooms on the first floor are also covered in damask of a blue shade, with blue velour upholsterings and Circassian walnut furniture.

The parlors and bedrooms, of which there are seven hundred and fifty, are richly furnished throughout, the walls of the parlors being covered either in silk damask or French silk flock paper; the woodwork is either mahogany or white, with plain but elegant mahogany furniture.

The greatest care was exercised throughout to obtain perfect color harmony in all the rooms, and carpets, upholsterings, draperies and wall papers tone together perfectly without the slightest discord. Many of the fabrics and wall papers were made specially to order.

Each parlor has a clock upon the mantel, which is controlled, set and wound automatically by the great Magneta clock in the lobby. This remarkable and beautiful piece of mechanism was made in Saxony, and is the first master clock to be introduced in the West.

On the twelfth floor of the north wing are the bachelor's rooms, with gymnasium, shower baths, fresh and salt water baths, massage rooms, etc.

In the arrangement for service, one sees the results that have been gained by the dominant ambition of the management. By the pneumatic-tube service orders may be sent instantly from any floor or dining room and visitors' cards sent up. The service pantries on every other floor (furnished with ovens and refrigerators) insure prompt and satisfactory service to every room. The hotel maintains its own electric and cold storage plant, tailor shop, laundry, etc. All water is filtered, and the air filtered, heated and washed, and a new supply provided to the entire hotel every ten minutes without causing a draught, by a perfect system of pumps and exhaust pipes.

There is really no finer interpretation of the art of public hospitality in the United States today, than is now presented by the completed three-winged Hotel St. Francis.

* * *

The Cement Industry in 1908

Mr. Edwin C. Eckel, of the U. S. Geological Survey, has made an estimate from data available at this time that the production of cement in the United States in 1908 was 40,000,000 barrels, a reduction of about 8,800,000 barrels from the production of 1907, or 18 per cent. There was also a falling off of imports from about 2,100,000 to about 950,000 barrels. Exports of domestic cement and re-export of foreign cements both fell off, one nearly balancing the other, so that the total consumption of Portland cement in 1908 was not far from 41,000,000 barrels as compared with about 49,000,000 barrels in 1907.

This is the first drop in the history of the American Portland cement industry.

* * *

Bohemian Club Competition

The plans of Architect Loring P. Rixford, member of the San Francisco Board of Supervisors, for the Bohemian club building, have been accepted in competition with drawings submitted by some eighteen other architects, all members of the club. Mr. Rixford's drawings will be shown in a future number of the Architect and Engineer. The estimated cost of the building is $250,000.

The Acoustic Properties of Brick, Tile and Terra Cotta.

ALTHOUGH a great deal is known concerning the acoustic properties of wood, and of various metals used in construction, it is not a little remarkable that analogous properties in brick, tile, faience and terra cotta should be so little understood. This ignorance arises in great measure from the circumstance that both physicists and architects have contented themselves hitherto by considering acoustics from the point of view of the shape of interiors of buildings only. Or, in a secondary way, the materials lining the walls, and such as may be regarded as capable of reinforcing sound, have received some attention. As a matter of fact, in many large buildings such things as resonant boards, reflectors, and matchboard dados are quite subservient to the chief materials of construction as often laid bare in the walls of the higher part of the building inside. Again, we commonly find that at least some considerable part of the walls is lined with clay goods in some shape, such as tiles, glazed panels, and the like.

Everybody who has studied the acoustics of large buildings admits that the chief enemy to deal with is reflection of sound, which produces echoes and general uncertainty in hearing, no matter whether the lecturer be strong or weak in voice. Consequently we find that when the building having been newly put up, the acoustic properties are bad, the first thing the architect flies to is that which he understands best, namely wood. During the present century there has been quite a boom in that material, though we ought not to forget the metal reflector placed over the pulpit in St. Paul's Cathedral, which has been so successful in that particular case.

Yet, but a little consideration of some elementary problems in physics suffices to show that wood is by no means always desirable, or can be in any way successful, in the interior of many edifices. Wood is a great reinforcer of sound by reason of its elasticity, but that very property is disastrous in certain interiors.

Sound is most perfectly reflected from smooth surfaces, and when acoustics of the interior are bad owing to form of construction, and reflection is wanted, what could be better than glazed surfaces? Large glazed tiles, or faience work in panels, are most admirably adapted for the purpose, but how often do architects use them for their acoustic properties? On the other hand, when owing to interior shape of the building reflection from the walls is not wanted, where can any better material than porous clay-goods be found? When echo is too manifest, and the building is largely utilized for the performance of music, we commonly find that attempts are made to lessen it by using drapery. An interior designed by the architect to show off its noble proportions, or enriched by the frescoes of some Royal Academician, or embellished by beautiful marble panelling and mouldings is thus ruined. For the right interpretation and appreciation of orchestral music it is absolutely essential to stifle echo at its birth. We should hear only that which proceeds direct from the executants to our ears, and the harmony should not be disturbed by the reverberation of the musical notes from side to side of the building. It is to be noted that intensity of the sound is not the leading factor in such a case as this. If a little water be violently thrown on the surface of a smooth-faced wall it glances off, and the same thing will happen with a large quantity; on the other hand, if either the large or small quantity be thrown on to a wall having a porous surface much in either case will soak in. And so it is with sound. If the grand interior which we have just been alluding to were constructed of

porous clay-goods, the architect, the Royal Academician, and the embellisher still have their chance, and the drapery could be done without.

We do not ask modern artists, with all their fanatic and æsthetic ideas, to succumb to science or to pander to the worker in clay, but we are perfectly justified in reminding them that many of the ancient works of art which they all but worship are the work of clayworkers. They seem to forget this. Their ideas are confined (like the latest craze in art) in straight lines and angles; they have set up for themselves a certain number of cast-iron regulations, which may be likened unto the by-laws of a County Council. They can see art in ancient clay work, but not in modern, that is because they have moulded themselves into that train of thought. Once get rid of that, and we can furnish both the artist and architect with materials such as the ancients had in the interior of their buildings, which were then, and are now, in many respects acoustically perfect, which were then, and are now (in ancient structures) admired for their artistic beauty.

We have said that clay work is often superior to wood work for acoustic purposes; we will substantiate that point by referring more particularly to the merits and defects of both for the uses named. Let us begin with wood. Here we have a material with a fiber; we cannot get wood without fiber. Fibers act as wires and are conductors of sound like the water. Consequently if sound strikes a match-board surface, much of it is immediately given a biased direction in the direction of fibers. This bias is useful when the wood is to act as a species of sounding-board, but when echoes are to be minimized (as is more frequently the case) it is to be deprecated. Wood with knots is better as retarding the propagation of sound within the fibers, than is wood with straight fibers.

But for sound-proof walls, if wood is to be employed, it has to be cut in such a way as to make the general construction somewhat expensive. Now all this can be done away with if such a material as terra-cotta be employed. The velocity of sound in a body is a fair index of the use of that body for acoustic purposes. As would naturally be supposed, the velocity is not so great in loosely compacted materials as those more closely aggregated. If the object in the wall be to stop sound from going through it, then it might be lined with exceedingly porous terra-cotta. If on the other hand, the surface is to be of neutral character, terra-cotta, with a "semi-vitreous" face is more suitably employed. If, as in many small country churches, the upper parts of the wall above the dado are to be left bare, the brick showing should always have a fairly hard surface so as not to soak in the sound too much. But, for a church having a central dome, underneath the center of which the pulpit is to be usually placed, the interior of the dome if left bare (commonly the case with small churches) should be made of strong rubber, and we should not object to the light porous kieselguhr brick for such a purpose.

It may be taken for granted that the velocity of sound is greatest in hard brick, such as ruabon-red, metalline, hard blues, firebrick and stocks and least in gaults, ordinary red, and sand rubbers. To recapitulate, therefore, the former class should be employed for conducting and reinforcing sound, and the latter for the reverse as sound-proof materials, and in stifling echoes.

Majolica and faience, when used in broad and flat surfaces, must increase echo, and when used very thin must be fairly resonant; when much broken up, however, either by frequent jointing, or when projecting in pattern, sunk or raised, its effects must be mainly of a neutral character.

The problem of the obnoxious party wall may be readily solved by using soft brick jointed with good mortar, taking that the wall is solid throughout; the difficulty of noise in flats from one floor to the other might be very considerably done away with by using majolica and faience ceiling mouldings for

all angles, and by constructing the face of the wall of the porous brickwork, faced by plaster of a more or less porous character. Sound reflectors for public buildings, not for reinforcement of sound, but for giving it direction, would be more suitable when made of porous earthen ware, and this would be much less unsightly than metal reflectors and tubes.

In short, the capabilities of clay goods in the directions indicated for assisting and modifying sound, are much more worthy the attention of architects than has hitherto been thought; less worthy materials have had a long trial, now give "brick, tile and terra-cotta" a better chance.

* * *

Smoky Chimneys.

TO THE architect, the builder, and the householder alike, the smoky chimney has been a bugbear, it is not too much to say, for hundreds of years. There are two principal causes why a chimney should smoke, says the Building News and Engineering Journal. A long flue full of cold air, and itself built of cold material, is one. The air is heavy owing to its low temperature; the lighter, heated gases in which the smoke is contained have great difficulty in forcing their way up, and it is necessary, as it is called, to create a draught. Every householder knows this elementary fact, owing to the difficulty of getting a flue to draw properly when the fire is first lighted in autumn, after a summer's rest. In large chimneys, used for manufacturing purposes, the difficulty is got over by a forced draught, but in the ordinary, every-day house such an expedient is impossible of adoption. To prevent the flue from cooling too much or too suddenly is the only sure preventive. This, as all architects know, is done most surely by grouping the flues together in the middle of the house, so that all are kept more or less warm from their proximity to that from the kitchen range, which is in use all the year round. If, as happens in many houses, there are distinctly two sections—one devoted to the kitchens, and the other to the household—two such groups of chimneys have to be formed, and the household group has often to run the risk of being idle for a great part of the year, unless, indeed, it is possible to carry up within it a flue from a basement heating apparatus which is used for hothouses.

From what has been said it will be recognized that to put a fireplace on an outside wall is to invite disaster. Many careless designers think little of doing this, considering nothing else than the position of the fireplace in the room, or the artistic effect of an external chimney. The discomfort caused by smoke, however, has to be reckoned with as well as the extra initial cost involved. It is clear that a flue which abuts upon the external air will cool quite rapidly, and the smoke difficulty may occur when lighting the fire in the morning after a hard night's frost, just as in the early autumn after a summer's rest. All the same, occasional external chimneys cannot be avoided. Where they are used, wisdom suggests that they should have a thick outer lining, instead of the usual four and one-half inches of brickwork, though comparatively few people, in these days of reducing prices to a minimum, think of doing this, except in high-class work. Tall chimneys, too, where they rise for some distance above the roof, ought to be at least nine inches thick externally, if rapid and undue cooling of the contained air is to be avoided. Yet it is rarely indeed that they are made so substantial as this, unless they are of stone instead of brick.

Another prolific cause of smoky chimneys is down-blow, resulting either from some accidental depression of the wind or the relative position

of the chimney with regard to some neighboring tall building, or trees, or even a neighboring hill—anything, in fact, which can cause a depression in the current of air with a strong wind blowing from a certain quarter. This evil is most acute, as a rule, in towns; while fireplaces on the top story of a building are more affected than those from the rooms below. It is recognized by the smoke puffing out in sudden bursts, corresponding with the gusts of wind. The means of cure are obvious. Either the chimney must be carried up to a sufficient height to avoid the cause of the down-blow, or else a specially-constructed chimney-top, or cowl, must be used.

There are many parts of Europe—hilly districts, most of them—where the open top is rare, the two sides of a flue being carried up, and a heavy stone lintel laid across, so that the smoke escapes laterally, and not vertically, while any depressed current is prevented from entering otherwise than across the flue-top, passing through the opening rather than down the flue, and so helping rather than retarding the draught. A chimney such as this can generally be made picturesque, so that its adoption is often worth consideration; but the stone used as a capping must be sufficiently heavy to resist the jar of the sweep's brush without giving way in the slightest degree.

This cause of smoky chimneys is, perhaps, the most common of all in large towns, where roofs rise to many different heights, and almost all the cowls and patent chimney-pots upon the market have been devised with regard to it. Ugly as they are, there can be no doubt as to the efficiency of some of them, particularly those of the revolving type, which always turn away from the direction of the wind, while the louvre pots and cowls have also proved very generally successful. That they are hideous beyond description is entirely another matter; but it only requires the recognition of the fact that a cowl or specially-devised pot of some sort is essential for architects to select their pots in advance—for there are many forms of combined pot and cowl which are by no means inartistic, and at the same time efficient, and much more lasting than the metal erections commonly put up as afterthoughts—or else to design them specially.

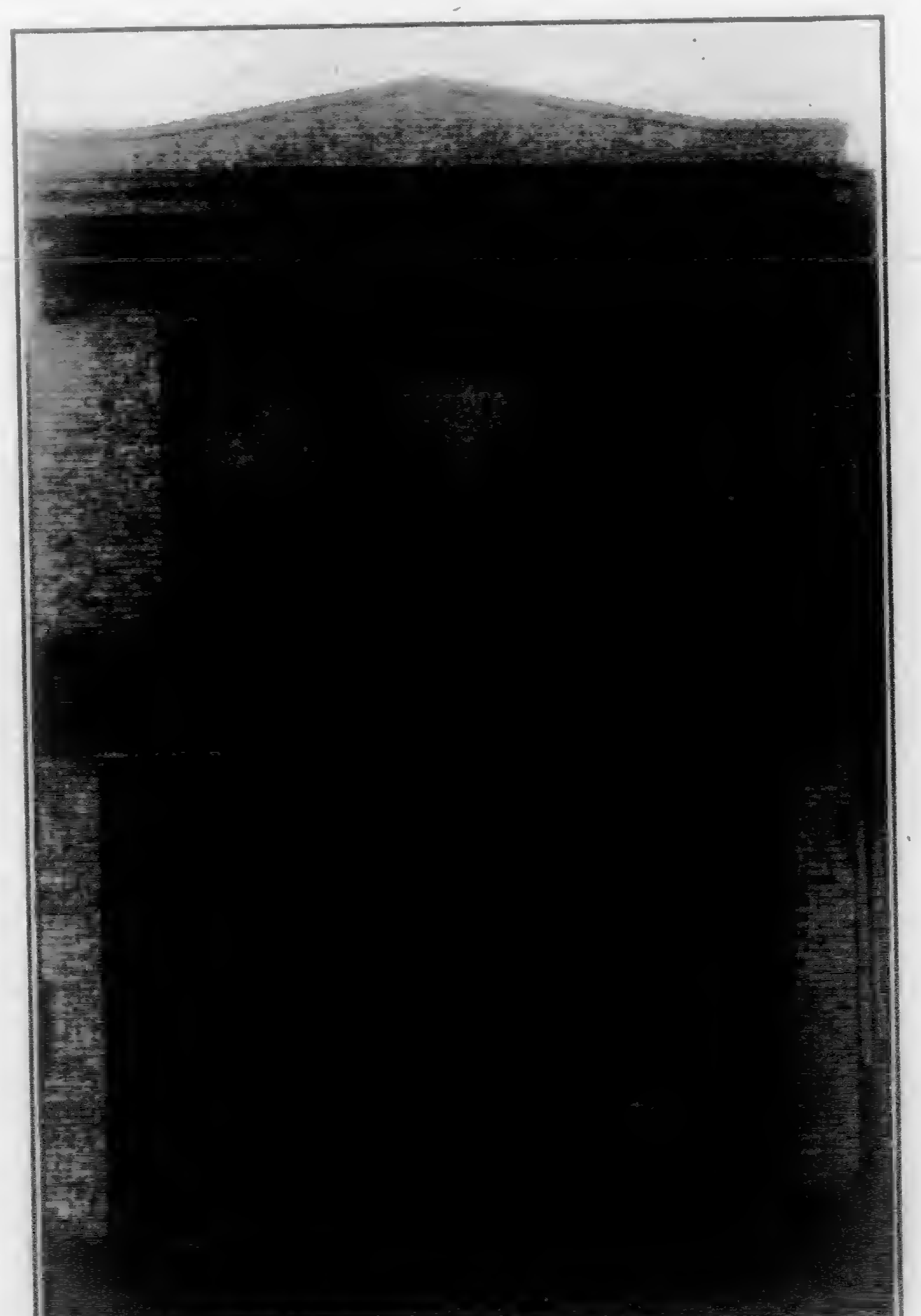
Another cause of smoke is an ill-constructed grate, with, perhaps, too small a hood or canopy, and insufficient ventilation. Nowadays, the fireplace has received so much attention that a badly-constructed one is much more difficult to obtain than formerly; but there are still many people who bottle up their rooms so completely that it is not easy for enough air to be supplied to carry the products of combustion up the flue. It must always be remembered that the flue, when the fire is lighted, acts as an outlet ventilator, up which there is a constant current of air. Consequently, there must be the same amount of air introduced into the room which the chimney serves, and, if this required amount is not allowed to pass in through sufficiently large openings, it will be drawn in through narrow cracks, and so cause draughts. The natural inclination of most people is to stop a draught by closing up the opening through which it passes, and so, by reducing the inlets, the supply of air to the grate becomes insufficient, and the chimney "smokes," because the smoke is not carried off with sufficient rapidity. When architects have to deal with people who are likely to bottle up their rooms in this way, the only safe thing for them to do is to provide a special air-inlet of ample dimensions fairly near the fireplace, preferably using one of the warm-air stoves, and so satisfying their client that they are warming the room at the same time that they are providing ventilation for it, and an air supply which is sufficient to prevent the chimney from smoking.

Owes its Success to Thorough Organization

THOROUGH organization has been the key to the success of the Butte Engineering and Electric Company of San Francisco, and the illustrations accompanying this article represent only a small percentage of the many buildings which this company has wired since the big fire less than three years ago. Carrying as it does a complete and up-to-date electrical equipment and employing a force of skilled mechanics, the company is in a position to perform the most exacting contract on short notice and at a legitimate figure. A manufacturing department is maintained in conjunction with the electrical business and many of the company's appliances are in use all along the Coast, including "a foot warmer," illustrated herewith. This warmer consumes very little current and is finished in nickel plate with a twelve-foot cord and plug, ready for use.

One of the illustrations shows a controller installed in the Olympic Club, and which automatically starts and stops the pumps for the swimming and drainage systems. The automatic starting and controlling devices used at Idora Park for the auto race course were designed and built by them. The use of electrical control has been made a study by their engineering department.

Electric hoisting machinery, cranes, etc., are designed and built by the Butte people, among the cranes put up being those at the Fremont Iron Works, the Carr Foundry and Machine Works, Dunham, Carrigan & Hayden Company's



Home of the
Butte Engineering & Electric Company

T. Paterson Ross, Architect
A. W. Burgren, Engineer

San Francisco



Fig. 1. High Tension Switch

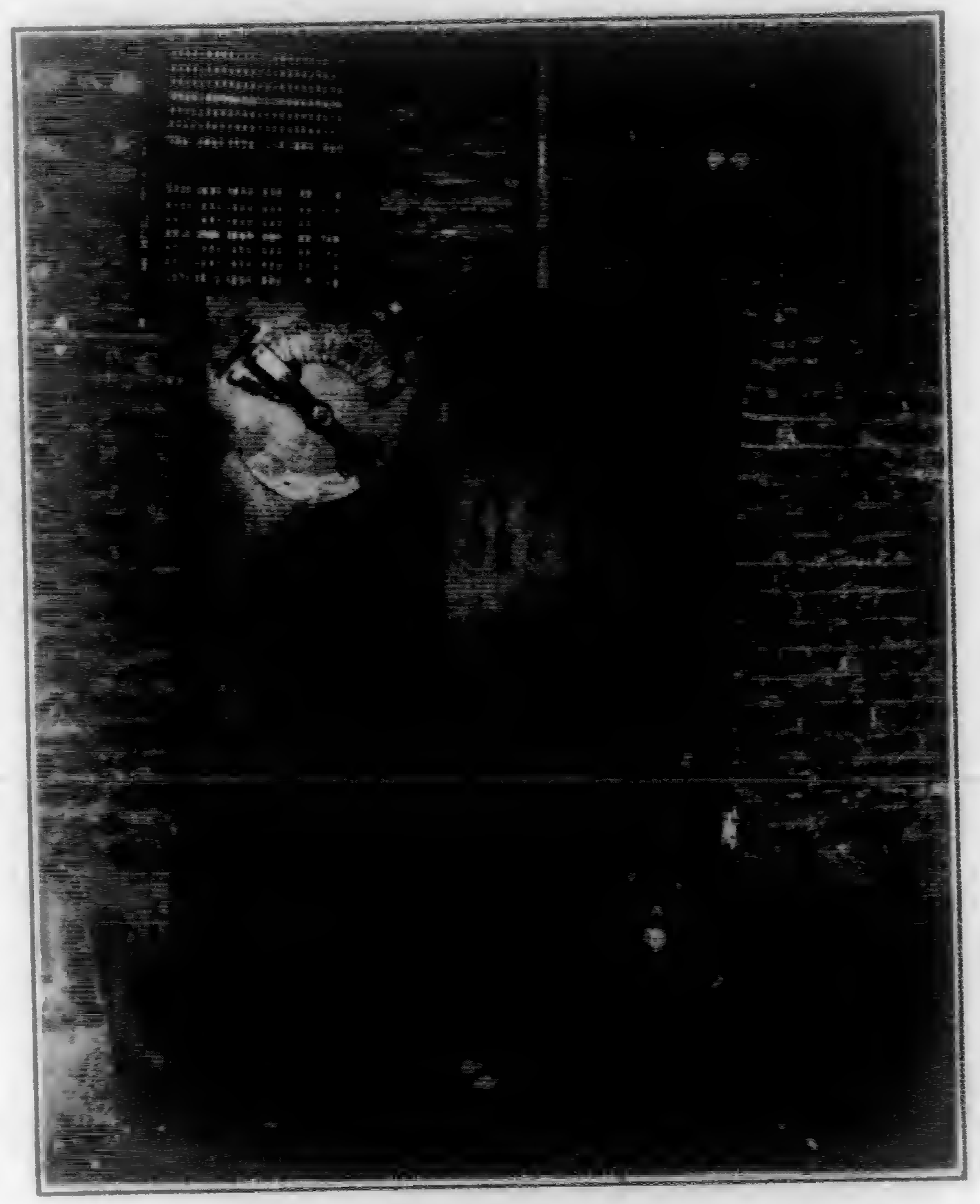
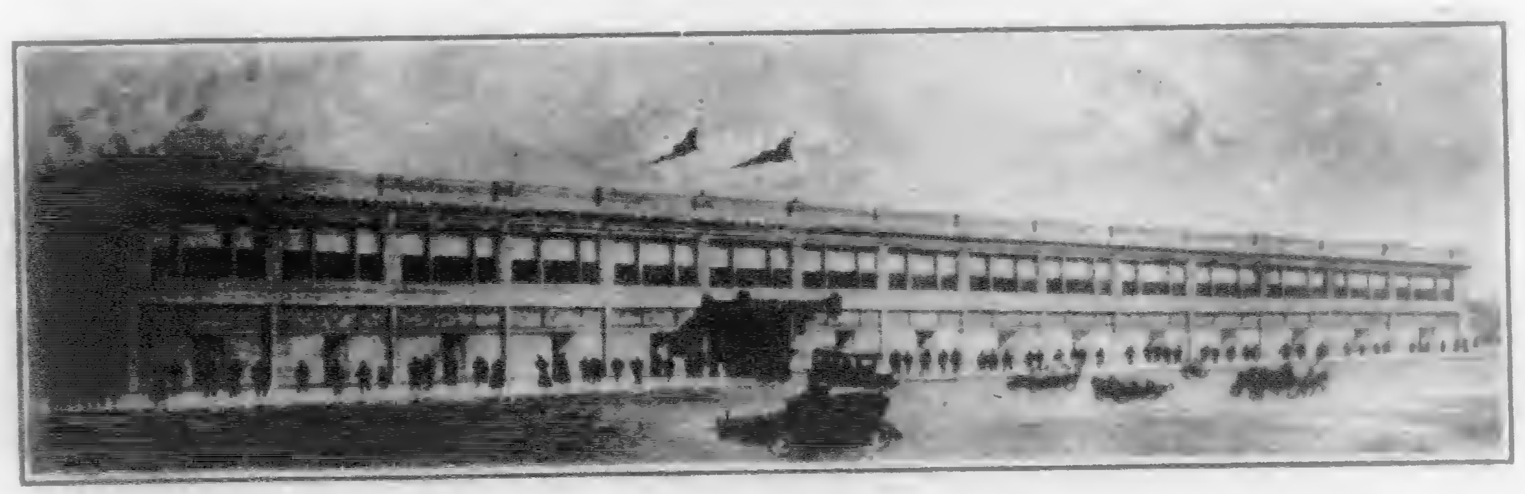


Fig. 2. Automatic Motor Starter in the Emporium, San Francisco



White Garage, San Francisco
MacDonald & Applegarth, Architects



Steel Arches, Fillmore Street, San Francisco

plant, and the Pacific Hardware & Steel Company, all in San Francisco.

The manufacture of switch boards is another production of their shops. Boards of their manufacture have been sent all through the West. One of the illustrations shows a generator panel which was installed by them during the last few months for the United States Government at Benicia Arsenal. The manufacture of switch boards which works hand in hand with their wiring has grown to large dimensions on account of their complete facilities in this line.

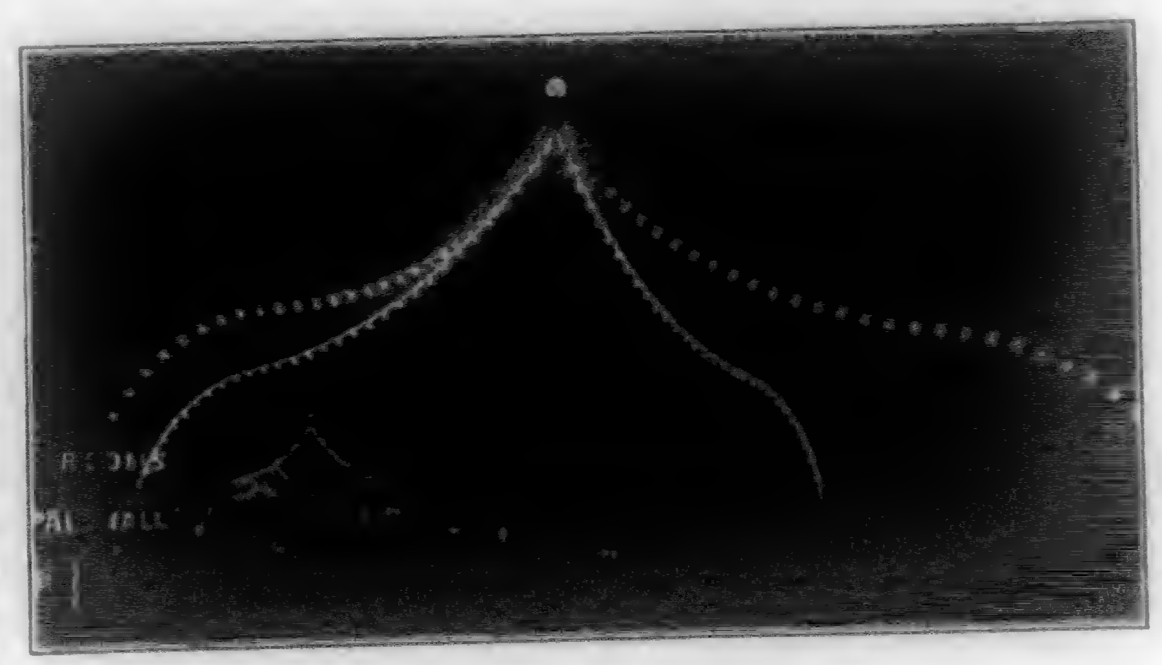
The constructon and manufacturing branches of this business are under the supervision of Paul C. Butte, assisted by A. B. Lebenbaum and Edwin B. Pike, who supervise the purchasing and finance departments, respectively.

Other illustrations shown here are recent products of home manufacture from the shops of the Butte Company, and owing to the fact that they are special devices and designed to fulfill certain unusual conditions, a description of them is of interest.

Figure 1 shows one of a number of high tension switches, furnished to the Northern California Power Company. In the early part of 1906 the American River Electric Company was on the market for a switch to successfully control a circuit carrying 30,000 volts.

The designs of the Butte Company were submitted and accepted and the results were very gratifying. Nearly one hundred of these switches have been built for the different transmission companies throughout the country.

Figure 2 shows an automatic motor starter used for the purpose of fire protection at the Emporium in San Francisco. Any reduction of the hydraulic pressure in the pipe line caused by opening one or more of the fire hose valves closes a relay contact and starts up a fifty-five horsepower motor operating a rotary pump. The main feature about this starter is the fact that a small one-eighth horsepower motor is used to operate the rheostat lever, through a series of reduction gears. This makes the action absolutely



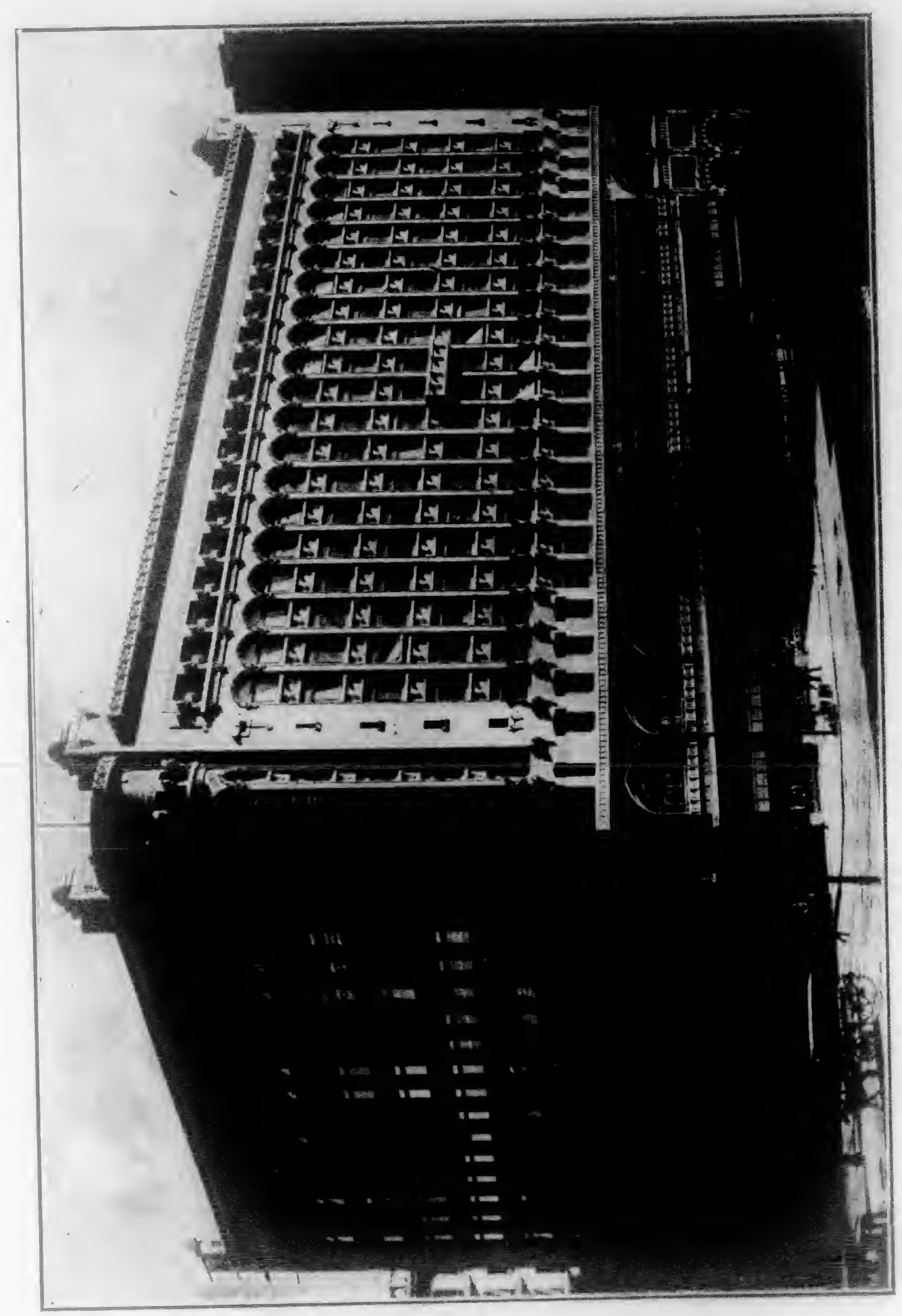
Night Illumination of the Arches



Interior View of Butte Engineering Company's Machine Shop



Slate Stock for Switchboards and Controllers



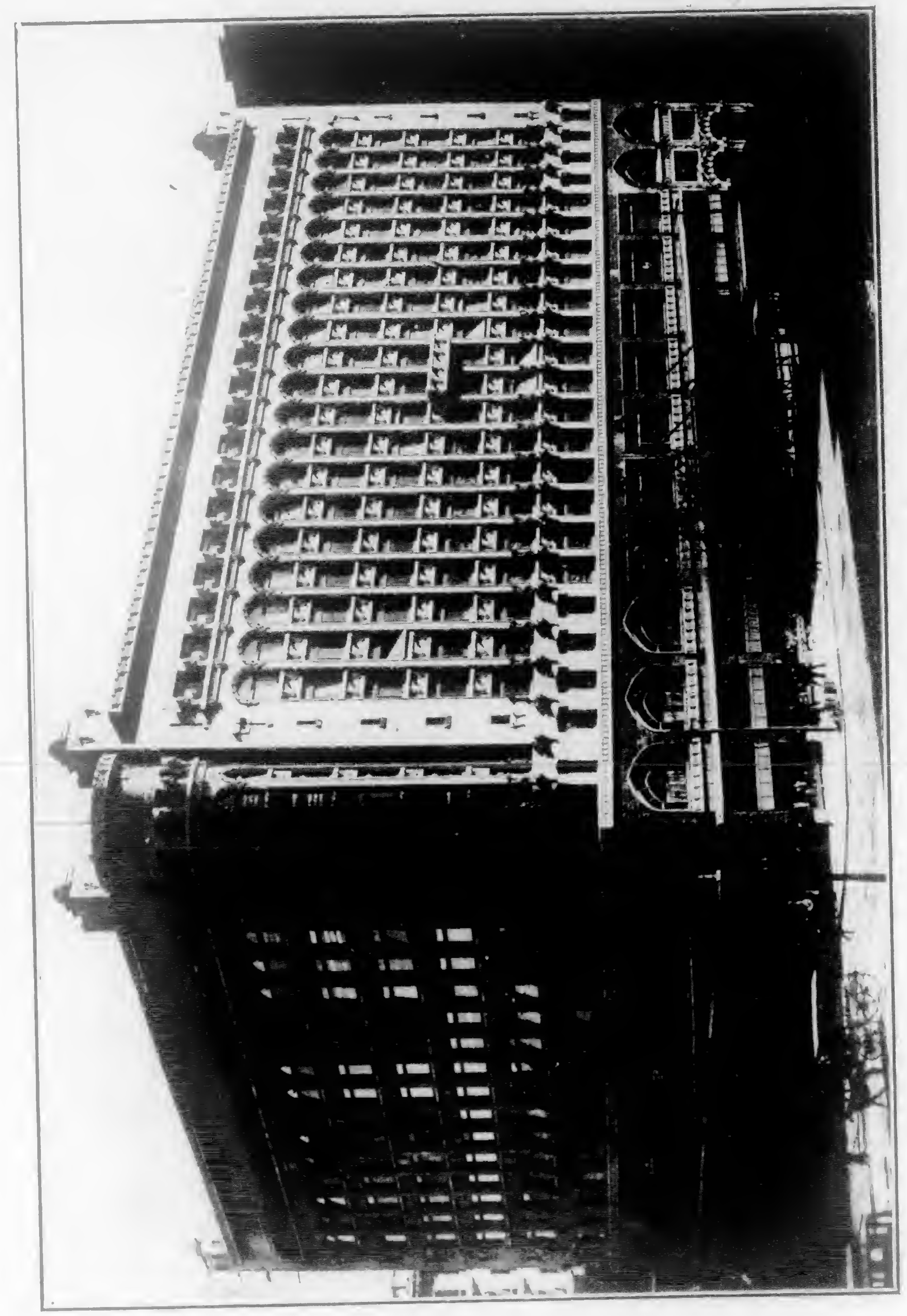
Pacific Building, San Francisco. Built Entirely of Reinforced Concrete
Chas. F. Whittlesey, Architect



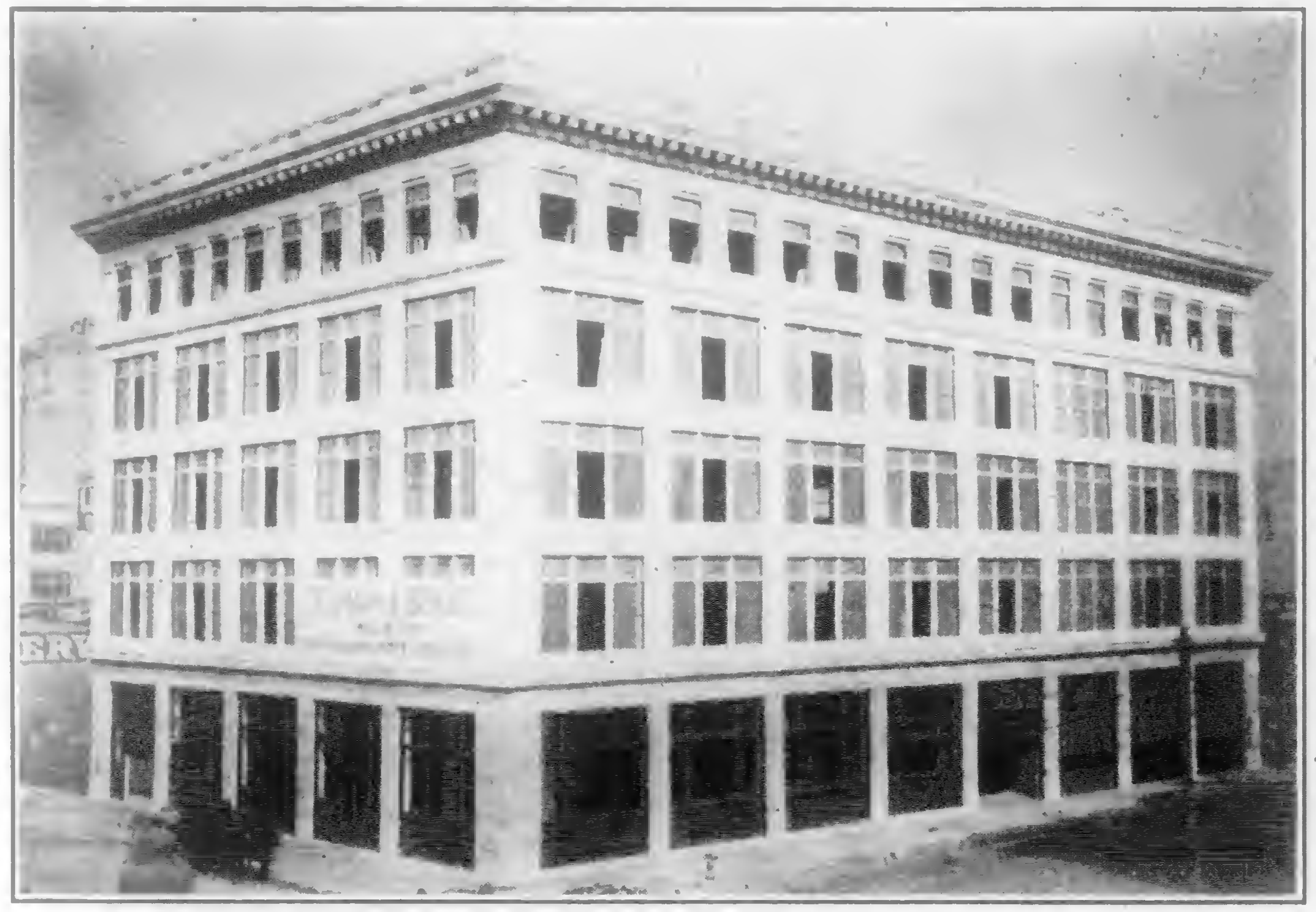
Interior View of Butte Engineering Company's Machine Shop



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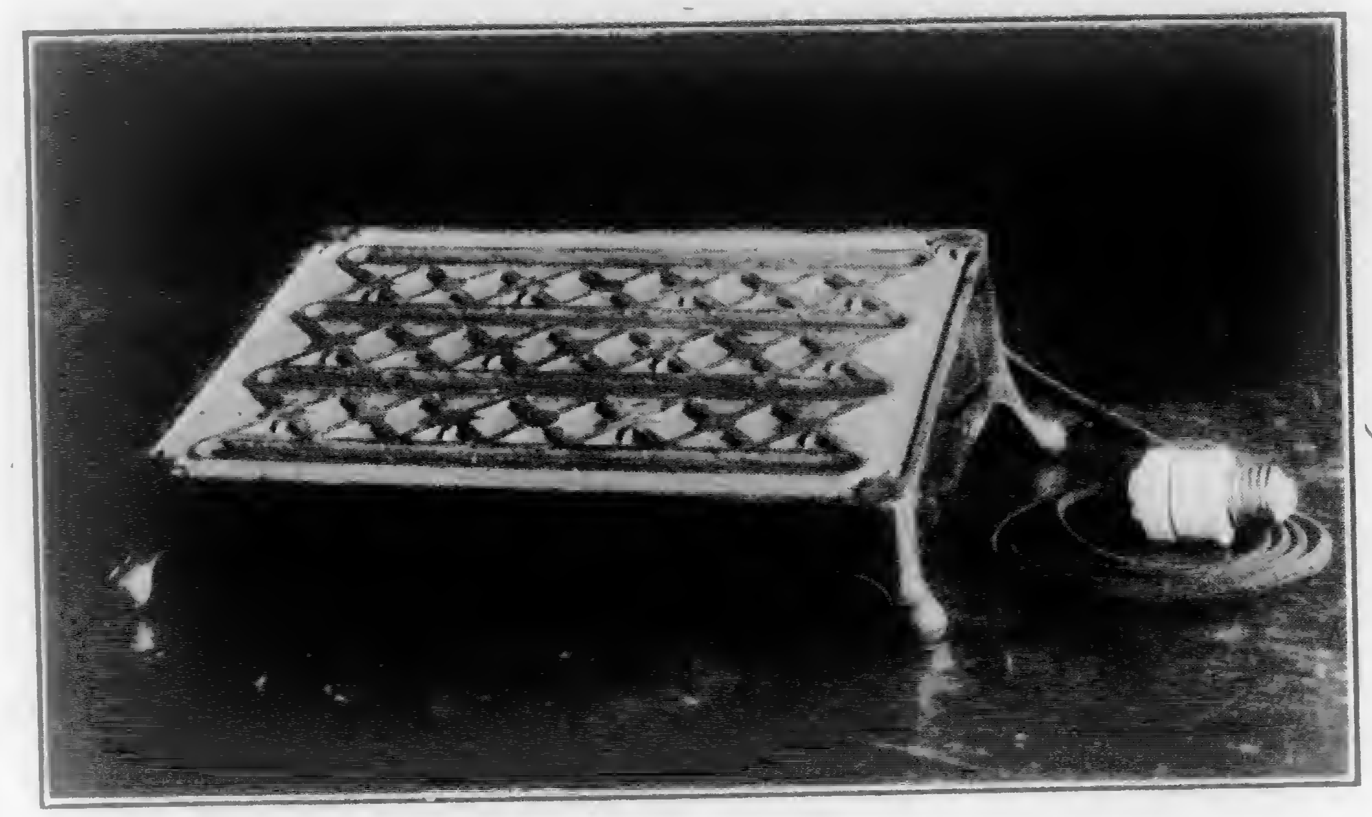
Pacific Building, San Francisco. Built Entirely of Reinforced Concrete
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Tillman & Bendel Building, San Francisco
MacDonald & Applegarth, Architects



Automatic Pump Controller, Olympic Club, San Francisco



An Electric Foot-warmer for Invalids and Use Under Desks

positive, which is obviously very essential to a system of this kind.

The Butte Company is also manufacturing a new electrical thermostat for controlling the temperature of the rooms of a building with advantages not attained heretofore.

* * *

Favors Competition for City Hall

To the Editor of The Architect and Engineer: I am very much pleased with your plan of a competition for a new City Hall outlined in your December number. I have a very convenient and beautiful design growing in my mind which I think would be eminently suitable, and if conditions are arranged so as to be fair and satisfactory I may feel it best to offer it, in very simple form, such as you suggest—I should say one, two or three floor plans and one or two elevations, possibly one section, all to scale of one-sixteenth of an inch to one foot. Anything beyond or additional, liable to make an unfair impression on the jury, ought to be barred out before being viewed by it.

I sincerely hope some competent person or committee will work out and issue a proper "programme of requirements," including a list of all departments to be accommodated, with number of offices and approximate area for each. As to limitation of cost, I should say it might be best in the first trial to leave this entirely to the judgment or disposition of the designer, because in this he would then show his disposition and his mastery of the problem more fully than if limited.

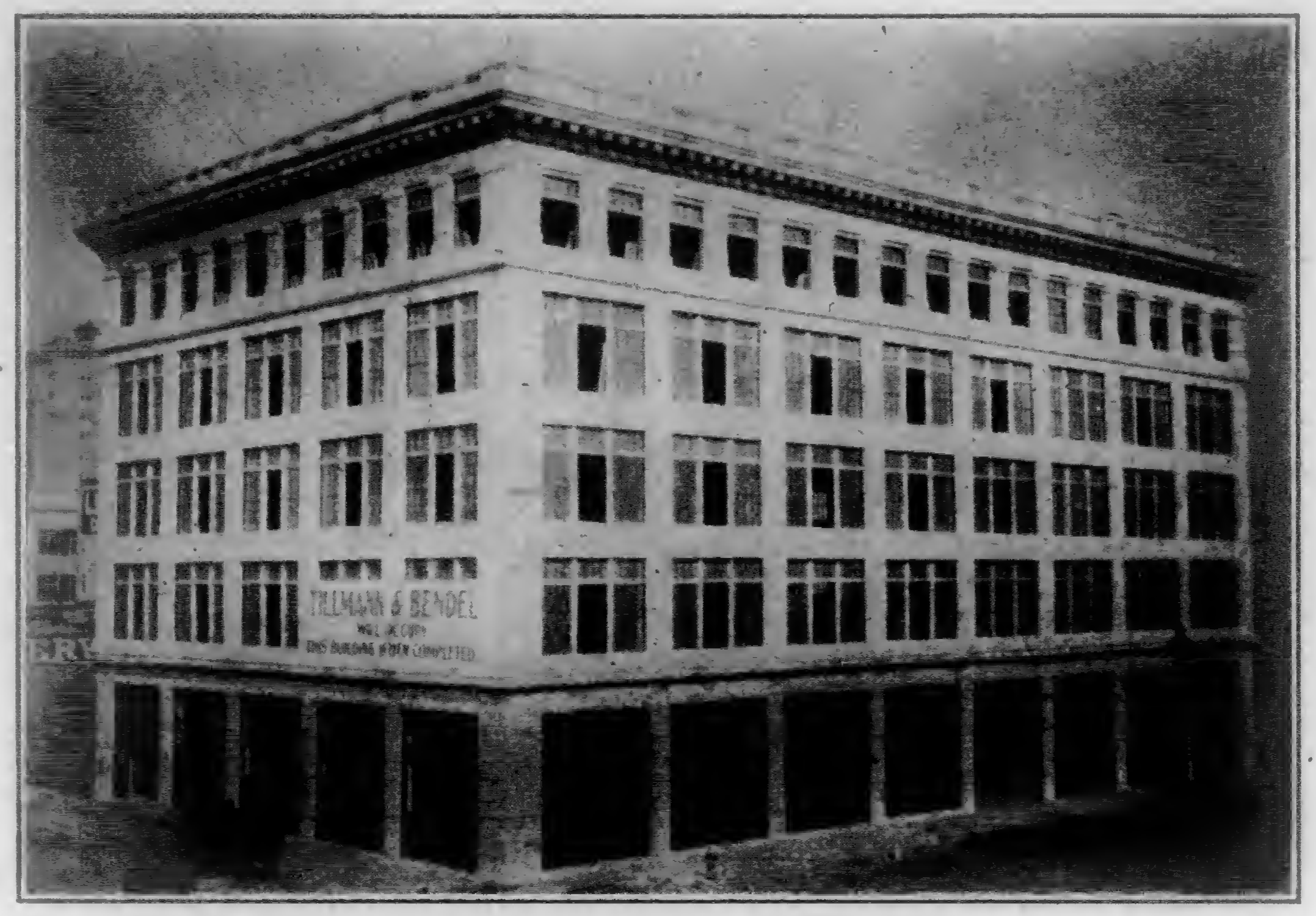
If he submits a design far too extravagant to give lasting satisfaction he would show himself to be much less trustworthy than otherwise; or if his design be too cheap and mean he would show that he had no adequate conception of what it should be.

Suitability for place and purpose is, of course, the dominant consideration. In the second trial, if deemed best, a limit might be named to aim for.

Very respectfully,

Louis Cowles, Certificated Architect.

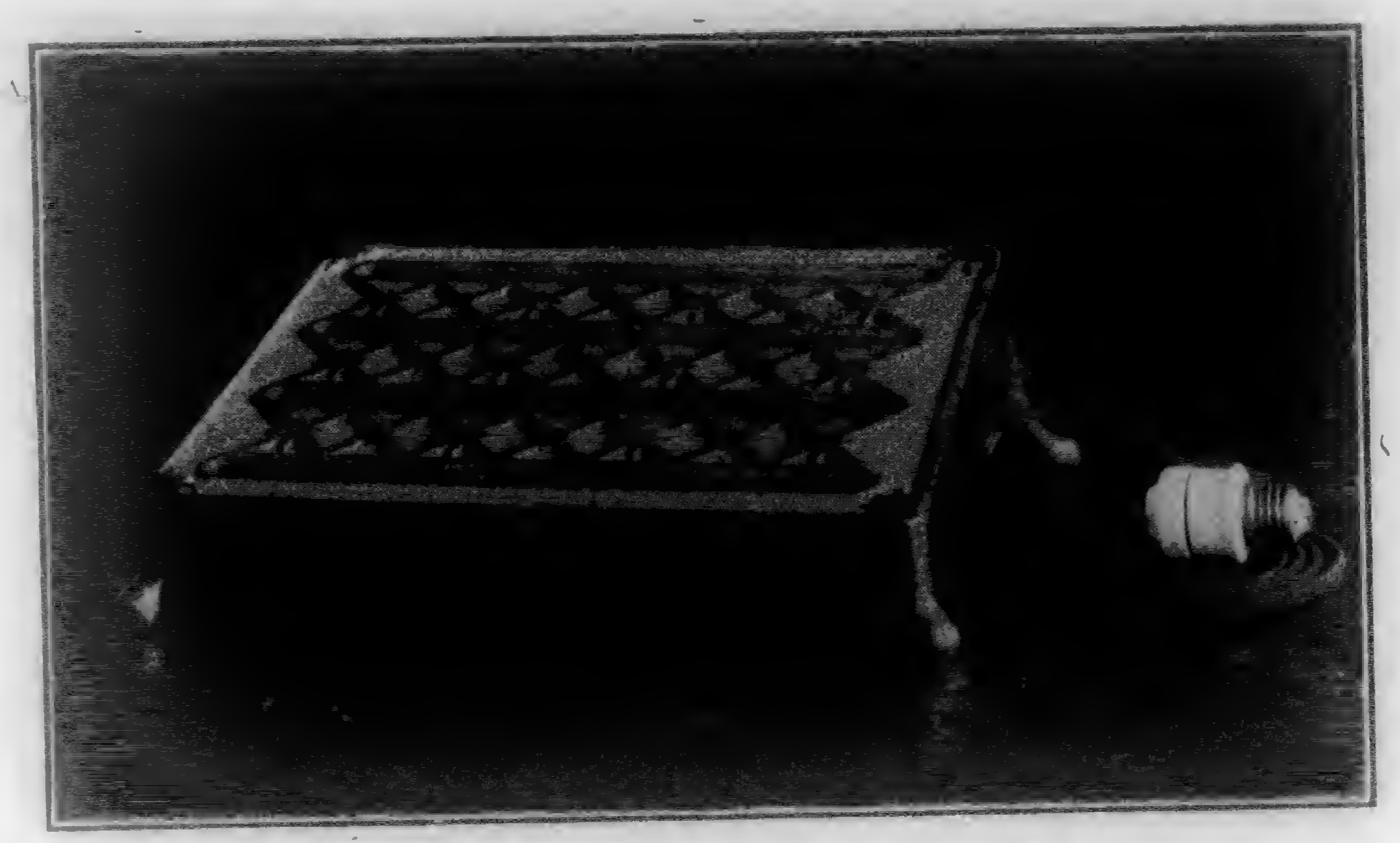
Santa Rosa, Cal.



Tillman & Bendel Building, San Francisco
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Santa Rosa, Cal.



City Hall, Portland, Ore. Whidden & Lewis, Architects
Equipped with Otis Elevators

The Portland Architectural Club's Coming Exhibition

THE Portland Architectural club is making elaborate preparations for its second annual exhibit to be held March 22 to April 10. Among the Eastern architects who have promised some of their work are McKim, Meade & White, Palmer & Hornbostel, Jules Guerin, The Boston School of Technology and many others equally well and favorably known.

Mr. John Knox Taylor, Supervising Architect for the United States Treasury Department, Washington, D. C., is sending a collection of perspectives and photographs of U. S. Custom houses and Post Office buildings that are being constructed or have recently been completed in some of the leading cities.

Applications for exhibition space for building materials of a decorative and artistic character are coming in fast.

The club will soon take up the work of planning an elaborate scheme of civic improvement for the city of Portland. Starting at the Union depot and taking in the park blocks, a civic center of great architectural beauty will be worked out with Main street and the court house plazas the focal point. The natural opportunities for fine architectural treatment of this subject are unsurpassed and the leading members of the profession here will co-operate in working it out.

At the coming exhibition the club expects to show the proposed civic improvement plans for the cities of San Francisco, Denver, Seattle, Chicago, Pittsburg, Cleveland and Columbus, Ohio.

The club is much encouraged with its efforts toward the formation of a Pacific Coast League, which, if fully carried out, will be of great permanent public benefit.

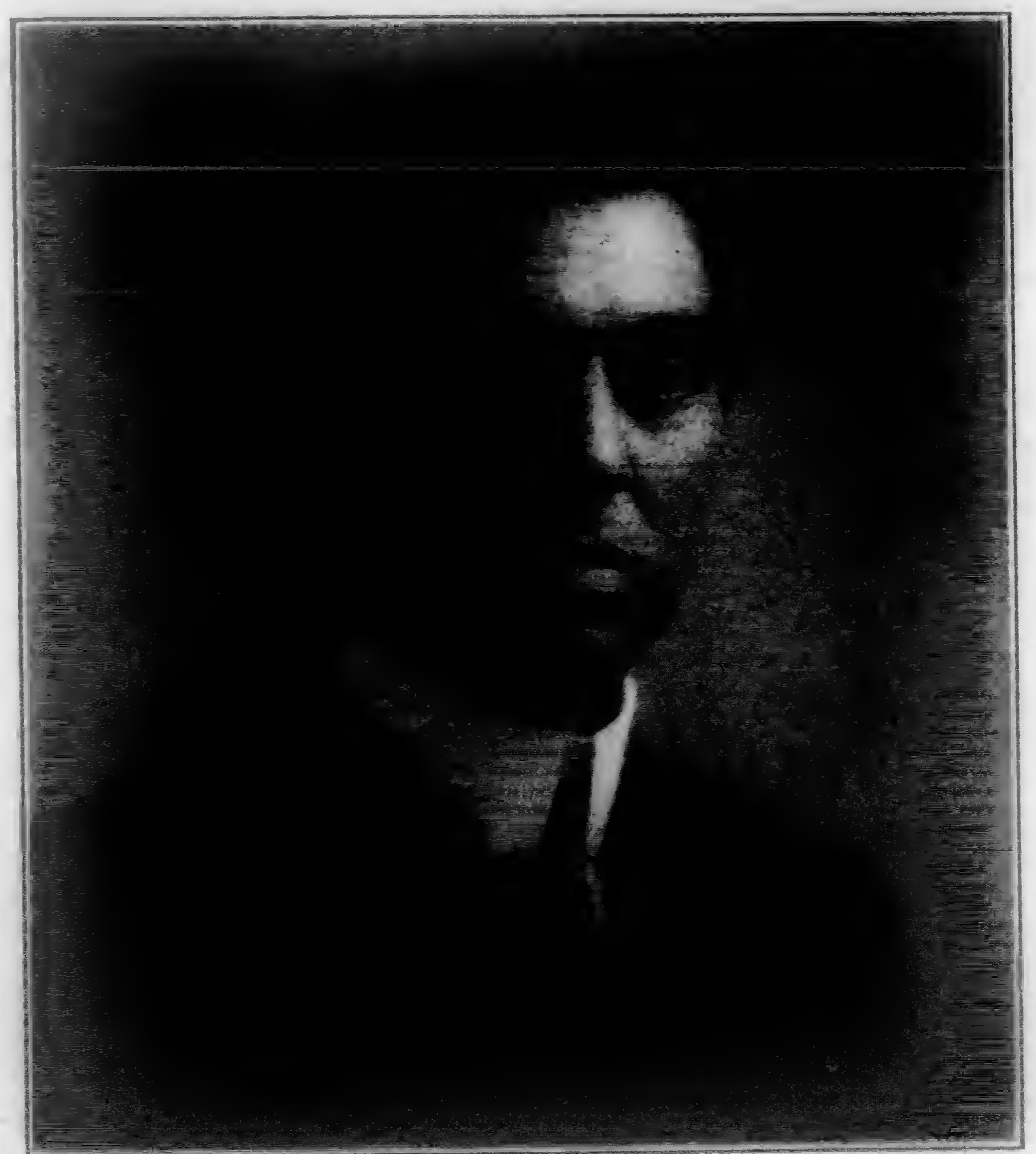
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Let every man be occupied, and occupied in the highest employment of which his nature is capable, and die with the consciousness that he has done his best—Sydney Smith.



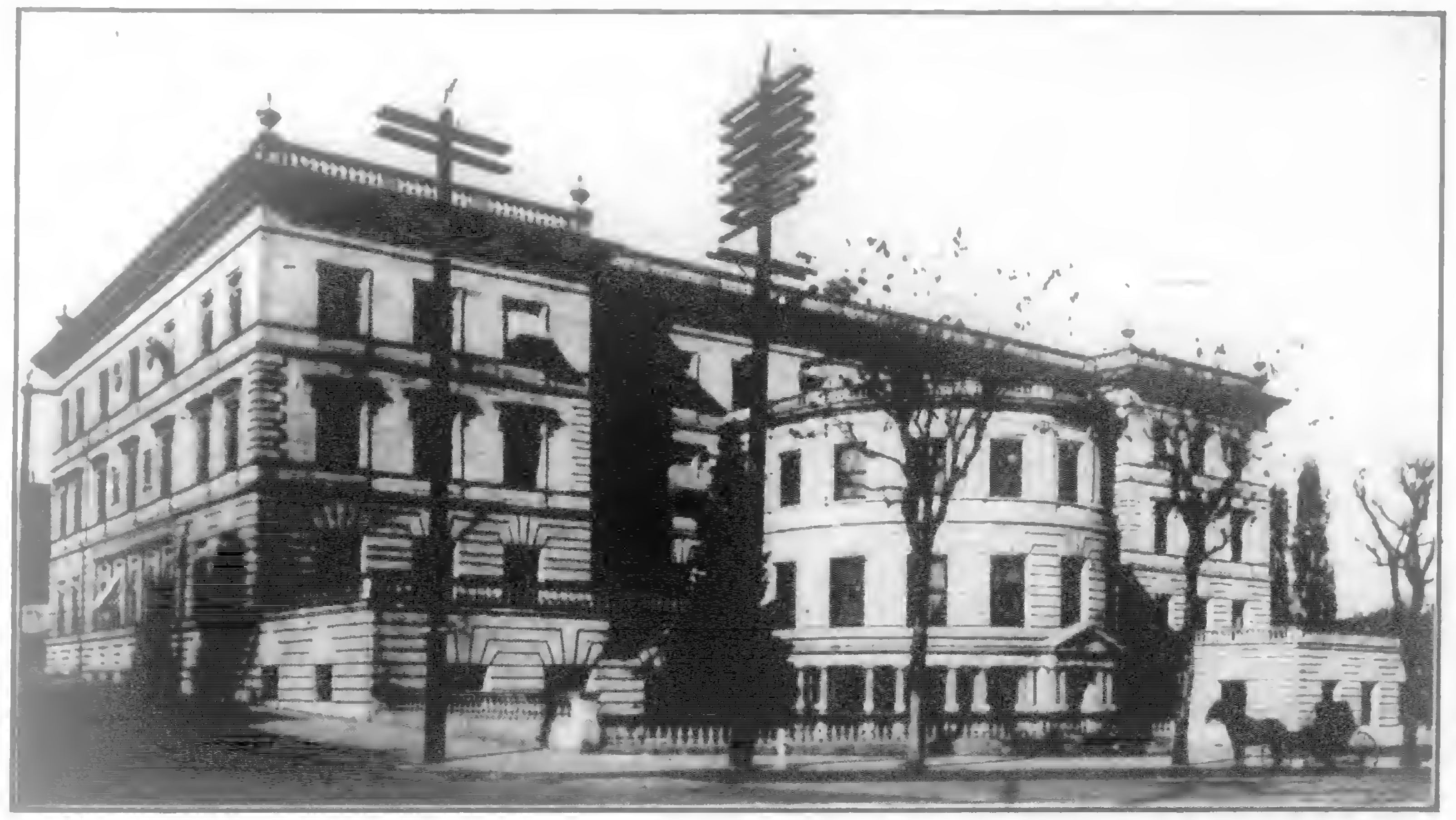
Joseph Jacobberger,
Architect.

President Portland,
Oregon,
Architectural
Club.



E. Kroner,
Architect.

Secretary
Portland, Oregon,
Architectural
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Mr. John Knox Taylor, Supervising Architect for the United States Treasury Department, Washington, D. C., is sending a collection of perspectives and photographs of U. S. Custom houses and Post Office buildings that are being constructed or have recently been completed in some of the leading cities.

Applications for exhibition space for building materials of a decorative and artistic character are coming in fast.

The club will soon take up the work of planning an elaborate scheme of civic improvement for the city of Portland. Starting at the Union depot and taking in the park blocks, a civic center of great architectural beauty will be worked out with Main street and the court house plazas the focal point. The natural opportunities for fine architectural treatment of this subject are unsurpassed and the leading members of the profession here will co-operate in working it out.

At the coming exhibition the club expects to show the proposed civic improvement plans for the cities of San Francisco, Denver, Seattle, Chicago, Pittsburg, Cleveland and Columbus, Ohio.

The club is much encouraged with its efforts toward the formation of a Pacific Coast League, which, if fully carried out, will be of great permanent public benefit.

* * *

Let every man be occupied, and occupied in the highest employment of which his nature is capable, and die with the consciousness that he has done his best—Sydney Smith.



Joseph Jacobberger,
Architect.

President Portland, Oregon, Architectural Club.



E. Kroner,
Architect.

Secretary Portland, Oregon, Architectural Club.

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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San Francisco Chapter A. I. A.

By Sylvain Schnaittacher, Secretary

THE San Francisco Chapter, American Institute of Architects, held its regular quarterly meeting in the green room of the Hotel St. Francis on Thursday evening January 21st. A large attendance sat down to dinner, after which the Chapter transacted business of importance to the profession.

At the conclusion of the business of the evening, Mr. C. R. Ashbee, a prominent architect of London, and a leader of the Arts and Crafts movement in England, favored the Chapter with a very interesting talk on the Arts and Crafts movement in England and the United States.

Mr. Ashbee stated that it was a privilege and pleasure to have listened to the discussion which had taken place. He had also attended Chapter meetings, with equal pleasure, in New York, Philadelphia, Chicago and Seattle, and found that the same problems which had been under discussion in the San Francisco Chapter were troubling the Chapters whose meetings he had attended. He stated the object of his journey to this country was to learn what was doing in the Arts and Crafts movement as applied to architecture. He was pleased to note the sympathy in the ideas between England and America, and that the trend of progress in both countries pointed in the same direction. That this feeling is now greater than it was eight years ago, and has attained an immense growth from what it had been twelve years ago on his first visit to this country. The reason was that the problems were fundamentally the same.

Mr. Ashbee further stated that Arts and Crafts as applied to architecture means disregarding the customary usage of the term which is associated with ladies fiddling with silver and leather or what drummers mean by machine made furniture; it being the direct expression of the artisan through the material in which he works, without the aid of machinery.

To establish a standard of excellence in this respect required discrimination of what ought and what ought not to be done by machinery. Machinery destroys the expression of a man's individuality when it is applied to sculpture or carving. The greatest progress in the Arts and Crafts movement made in the United States, was in

Mr. Ashbee's judgment in the field of ceramics, and he called particular attention to the beautiful work in Chicago and Philadelphia, where ornamental and colored tiles had been intelligently applied to enrich some of the buildings.

However, the greatest aid to the movement was from the manual training work in the schools and colleges, in which great interest has been shown throughout the country, but that it would probably take about twenty-five years to reach its full development.

Mr. Wm. Chas. Hays, the Chapter's delegate to the annual convention of the American Institute of Architects at Washington, D. C., gave an interesting report of the proceedings of the convention, stating that he had attended each session of the convention, that much important work had been accomplished, the most important having resulted in the organization of a Bureau of Fine Arts by President Roosevelt. The deliberations which resulted in the organization of the bureau were brought about by the report of Mr. Geo. Oakley Totten, Jr., the American delegate to the eighth International Congress of Architects at Vienna. At the Congress at Vienna, all delegates were instructed to work upon their return to their respective countries for the establishment of Bureaus of Fine Arts, similar to the French, Austrian and Prussian bureaus, the only ones of the kind in existence at that time. Mr. Hays also gave a resume of the deliberations which had resulted in the adoption of the revised schedule of charges.

New Minimum Fee

At the recent convention at Washington, D. C., of the American Institute of Architects, it was decided to raise the minimum architectural fee from 5 per cent to 6 per cent. The general opinion seemed to prevail that under the complicated system of modern construction, good architectural service can no longer be given, with a proper margin of profit to the architect, under the 5 per cent minimum that has prevailed for some time past. The new minimum was particularly demanded by the Eastern architects, some mild opposition being offered by certain sections of the West, where it is said even 5 per cent minimum is difficult to enforce owing to the lower standards of owners in general.

Few owners, it would seem, really understand the amount of work and time required on the part of the architect in the preparation of preliminary studies, the working drawings, detail drawings and specifications, and the general direction and supervision of construction work, nor the expense involved. Those owners who do appreciate this will hardly deny the justness of the new minimum fee. Construction today represents many changes over a few years ago.

Second Annual Exhibition of Portland Architectural Club

THE Portland Architectural Club has sent out announcements for its second annual exhibition to be held at the Art Museum in Portland from March 22nd to April 10th. On the evening of March 22nd will be held a dinner and a private view for guests, members and the press. A reception will be held on Tuesday evening, March 23rd, and thereafter the exhibition will be open to the public.

A strong endeavor is being made to obtain from the East a choice exhibit which will be under the personal supervision of Mr. Vinson of Cleveland, who has been retained to take charge of the illustrated catalogue. The club has been in correspondence with such men as Jules Guerin and arrangements are being made with the Century company to obtain examples of Mr. Guerin's famous Egyptian series. Special attention is being given to domestic work, and to models and sculpture, in which departments last year's exhibit was somewhat weak.

The club will arrange for collectors and shippers in San Francisco, Los Angeles, Seattle, Tacoma and Spokane, and exhibitors notifying the committee as to their intention to exhibit will be advised as to what date and by whom their exhibits will be collected.

It is hoped that delegates from the various architectural organizations throughout the coast will be present at the dinner given by the club March 22nd, at which time there will be discussed the possibility of the formation of a Pacific Coast League of Architecture.

The Portland Architectural Club welcomes correspondence regarding this exhibition and the possibility of forming a Coast League. All correspondence should be addressed to the Exhibition Committee, 606 Concord building, Portland, Oregon. The committee is composed of Jos. Jacobberger, ex-officio; Ellis F. Lawrence, chairman; Edgar M. Lazarus, Morris Whitehouse and C. L. Linde.

Architect Morgan Returns from East

Architect Octavius Morgan of Los Angeles has returned from his eastern trip. He visited St. Louis, Washington, New York, Boston, Philadelphia, Pittsburg, Chicago, Kansas City, Denver and Salt Lake. Regarding building construction he is of the opinion that California's best buildings are as good as the best of the eastern built structures.

Mr. Morgan went East in company with Architects Rosenheim and Parmentier as delegates to the annual meeting of the American Institute of Architects, which was held in Washington. Architect Myron Hunt was also a delegate.

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THE "STATES' BUILDING" PROJECT

Just now, when the Government contemplates stopping a great department's business in order to turn over its building for the inaugural ball, when citizens of Washington are trying to raise subscriptions for a great convention hall, and when some of the southern states are combining to erect a Southern Congress building in Washington, would seem a most propitious time to revive and try to push to a materialization Architect Fitzpatrick's project of some years ago—a great States' Building, or Palace of the States.

There is great need of just such a structure, but it is one that the states will have to build; and not the federal government. The initiative may come from Washington, but the consummation must be effected in the states.

What we need is a structure that will be owned jointly by all the states. An average of $200,000 a state would build a structure that would rank with anything in the world and that would give all the offices and exhibition places requisite, besides a hall that would be second to none anywhere. Spite of that lack, Washington is now a great convention city. But the Capitol city covers itself with discredit in those affairs because there is no adequate place to do the thing in proper shape. The tuberculosis congress was a fizzle, and the foreign papers teem with criticism of the unfinished hall and the general shortcomings that attended that meeting. California undoubtedly would be glad to join in the movement, although it must be admitted the Golden State needs just such a building for its own conventions.

FIREPROOF BUILDINGS

Reinforced concrete enthusiasts are prone to overdo the claims for that material when they assert, as most of them do, that in itself it is ideally or even practically fireproof. The "American Architect," a leading architectural journal of the country, recently devoted an entire number to the exploitation of concrete

construction and illustrating the best work done in that material, but it conservatively states editorially:

. . . Finally it must always be kept in mind that concrete, while a serviceable fireproofing mixture, is not itself fireproof, and that in certain positions it must be protected by other fireproofing, whose function it shall be to absorb into itself inevitable disintegration due to impinging flame—or flame and water in alternation. . .

Another writer in the same concrete number of that journal says:

Carelessness, indifference and irresponsibility seem to be the order of the day, and this is particularly so in the building trades. Where materials can be inspected after erection, as in brickwork, stonework, ironwork, etc., it is very hard to get even passably good results, but with a material that has to be taken on faith, like reinforced concrete, it requires a perpetually optimistic temperament to prevent undue anxiety from spoiling one's peace of mind. . . .

The fireproofing of concrete structures deserves as much study as the fireproofing of iron structures. The advocates of reinforced concrete construction do themselves no credit and do their material a great deal of harm by claiming that concrete is a fireproof material. The simplest tests which can be made by a school-boy will prove that cement, after setting, cannot resist fire without detriment, and the point of absolute structural disintegration is determined solely by the length of time it is kept in contact with fire. A few briquettes, a kitchen range and a bucket of water will prove this in a most practical and satisfying way, and remove any lingering doubt one may have on the subject. . . By protecting the structural parts of the (concrete) construction with this material (porous, terra-cotta, fireproofing tile) it is possible to construct a building of great fire-resisting capacity at a cost considerably less than if structural steel, fireproofed with the same material (porous-terra-cotta blocks) were to be used. . .

"BURNT MONEY"

This is the title of an article in January Everybody's that everybody ought to read. Some years ago it was realized that the generally shoddy construction of our buildings made great conflagrations in our cities not only possible, but certain, and a fire prevention movement was set afoot. Mr. F. W. Fitzpatrick of Washington started it. He had studied the situation and, being one of the foremost architects and authorities upon construction in the country, was eminently qualified to advise how to go about the work. He organized the Building Inspectors' and other societies whose main purpose is to secure better buildings in our cities; he induced municipalities to revise their building codes; the insurance companies helped and the architects have helped. Mr. Fitzpatrick has put the matter plainly before the people and has written much upon the subject.

Articles by him have appeared in McClure's and other periodicals and newspapers, and now Mr. Samuel Hopkins Adams, one of the original muck-rakers, and who has been instrumental in securing many needed reforms in many directions, has assisted Mr. Fitzpatrick by writing this splendid article for Everybody's.

The editor prefaces that article by saying:

This is a record of shame. A sensational indictment of American extravagance. We know that our national fire bill was startling, but the facts and figures that Mr. Adams presents here shocked us. They'll shock you. Not satisfied with slaughtering our forests, we are burning up our homes at a killing pace every year. We are pervaded with pride over our superiority to the rest of the world, while actually our fires cost us more than the combined loss of any other six civilized nations. Here are the figures straight in your faces. You can change the record. Mr. Adams shows how. Remember, we cannot as a nation waste our substance and prosper.

Council of Fine Arts

President Roosevelt announces that he has asked the American Institute of Architects to designate thirty men, representing all parts of the country, to compose a council of fine arts.

The object of the council, which is to consist of architects, painters, sculptors, landscape architects and laymen, of which the supervising architect of the treasury is to be the executive head, is to advise upon the character and design of all public works or architecture, painting, sculpture, all monuments, parks, bridges and other works of which the art of design forms an integral part.

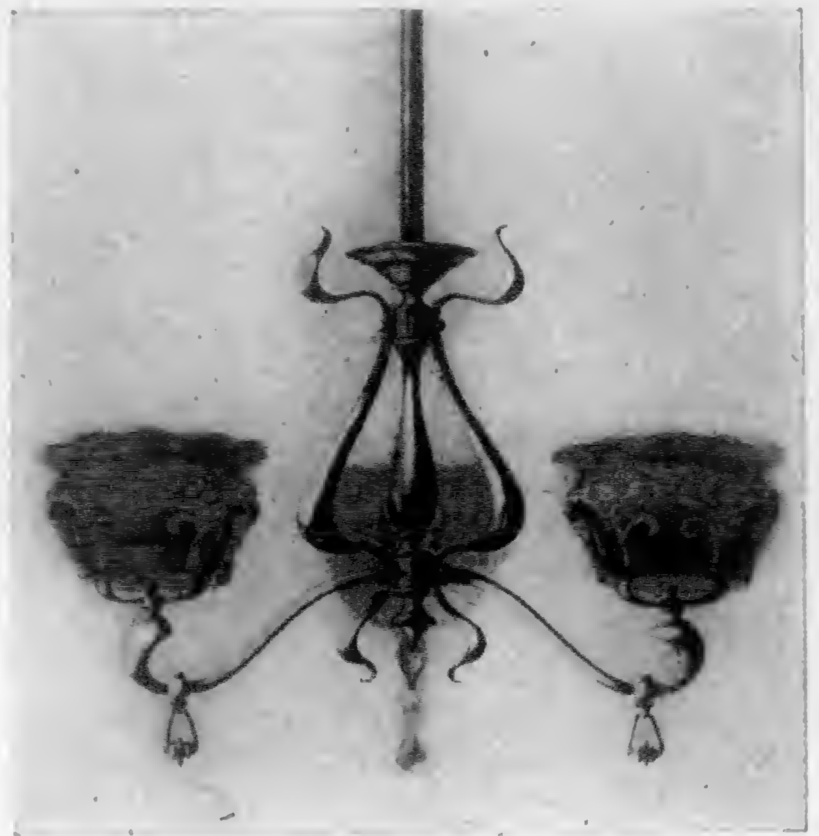
HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

The Possibilities of Artistic Effects in Gas Fixtures

By E. L. ELLIOTT, in the Illuminating Engineer

THERE is no denying the fact that the electric incandescent lamp, by reason of its greater adaptability, both in form, candle-power, and ability to be operated at any angle, the absence of uncovered flame, and the facility with which it may be turned off or on at a distance, may be given a greater variety of artistic effects than gas light. On the other hand, the cases in which full advantage is taken of its adaptability to produce special artistic results are comparatively rare and unimportant. This is due to two causes: first, the traditions of illumination that have come down from the days of candles and oil lamps have thus far overshadowed all other considerations in the artistic treatment of lighting fixtures; and second, the great majority of lighting installations neither demand nor justify such originality or novelty of design as would preclude the use of gas. In fact, practically all of the cases of electric illumination in which gas could not be substituted, so far as physical conditions are concerned, might be classified as spectacular lighting. With the latest forms of electric lamps, which can be burned successfully only in a pendant vertical position, there is practically no difference in the limitations imposed upon artistic design between gas and electricity.



An English Art Nouveau Design

An examination of modern high-class lighting installations, and the catalogues and sketches of American fixture manufacturers, will at once disclose the fact that by far the larger part of all modern artistic fixtures are either adaptations, or reproductions of fixtures that were originally produced from one to three centuries ago. As the candle was the only luminant then in use, various imitations or adaptations of the candle are to be found in a great number of the most pretentious designs of the present time. Whether or not such imitation is a legitimate form of art is a theoretical question which need not be discussed here. Architects and decorators, who in most cases are the keepers of their client's consciences on all matters of decorative art, demand the candle effect, and the fixture manufacturer very rightly conforms to this demand.



Fixture for Inverted Burners Imitating Electric Effects

Now, the candle can be most easily and most effectively imitated by the use of gas light. A short tube of opal glass sufficiently simulates the candle, while the open gas flame, though of totally different shape, is approximately an imitation of the candle's flame. Every one of the

fixtures of the French periods, which as models of artistic design have never been surpassed, are very easily adaptable to gas lighting.

The more efficient mantle burner has caused us to lose sight of the fact that there is a certain artistic effect in a flame that is entirely lacking in a fixed incandescent body. This was admirably expressed by Mr. Hartt in his description of the "Lights of Boston:"—

"It has this superiority over electricity. It moves. It trembles, flickers, is sensitive to the least breath of wind. It is fire itself, not an immobile semblance of fire. ******* While electricity itself is incomparably brighter, there remains a sort of hushed solemnity about its motionlessness. On the other hand, gas, blazing in countless dancing jets, excites a wild, barbaric joy, such as no incandescent orbs or lines or constellations can afford."

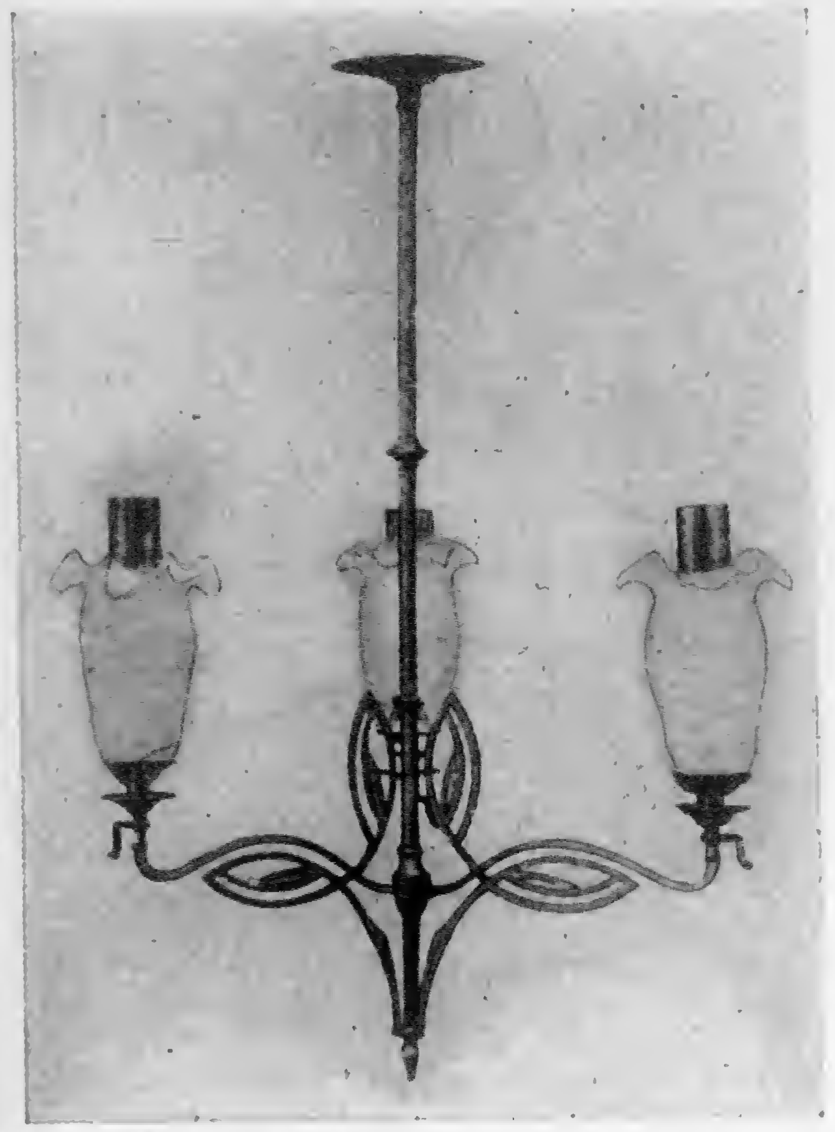
The first advice of the illuminating engineer is generally, "keep your light-sources entirely out of sight." In the case of electric lights this advice is good; the incandescent filament or the electric arc has no merit in itself to attract the eye: it is a source of light, nothing more. You would no more think of gazing at an electric light as a thing of beauty than you would think of sitting down to look at a steam radiator.

A flame possesses an element of irrestible attractiveness, whether used as a light-source or as a source of heat.

In general then, every "chandelier" design, i. e., fixture for holding candles, is reproductable as a gas fixture.

Again, by far the greater majority of all electric fixtures are also readily adaptable to gas light. A most curious fact connected with fixture design is the effort on the part of the promoters of each particular luminant to imitate the effects of some other luminant. Thus, both the gas and the electrical interests have assiduously imitated the candle. The electric light devotees have imitated gas, at least so far as the general construction of fixtures is concerned, and the gas interests have very successfully imitated the most familiar effects of the electric light. The inverted mantle burner, which marks the latest improvement in gas lighting, unquestionably had its origin in a desire to meet the incandescent electric lamp in its advantage of hanging in a pendant position and giving no shadows below. Mantle burners have also been designed which so closely imitate the electric lamp, even to the socket, as to escape detection by the ordinary observer.

A gas fixture requires a tube or pipe for the conduction of gas, and in the majority of cases electrical fixtures simply use this tube construction for the conduit wires, thus entirely avoiding any differentiation in construction and appearance between the two luminants. Occasionally, and of late rather more commonly, electric fixtures are suspended by chains, through the links of which flexible conduit wires are drawn. In Europe the flexible wire itself is very largely used to support the lamps and their accessories; but this construction has never come into use in this country owing to the ban placed upon it by the insurance underwriters. The flexible cord is really the only structural feature in a fixture that plainly declares the



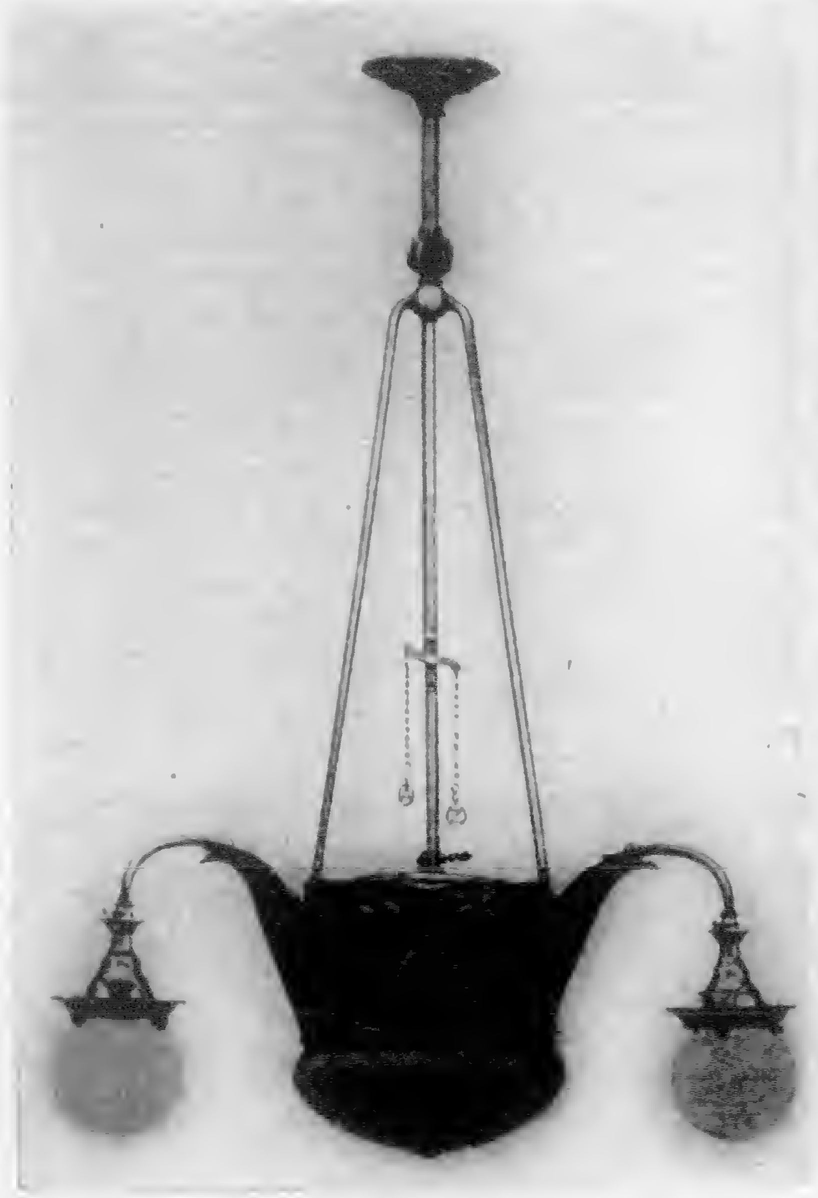
A Simple, But Pleasing Design for Upright Mantle Burners



source of illumination. The designers of gas fixtures, however, have been equal to the occasion, and have used fine copper tubes, twisted together to imitate a cord, to suspend inverted mantle burner, thus very successfully imitating

the electric effect. Why it is thought necessary to imitate in order to be artistic is an idiosyncracy of the human mind which we have never been able to fathom.

While the gas flame has a certain inherent artistic value which absolutely defies imitation by the electric light, the incandescent gas mantle in itself has no artistic value, and in this respect is on a par with the electric lamp; but by the judicious use of decorative effects in the metal construction and of glassware



A Combination of Bowl and Inverted Burners, of German Design

designed to form an integral part of the fixture rather than an individual unit, such a burner may be made as artistic a lighting device as any form of electric lamp.

There is a common saying that "Imitation is the sincerest form of flattery". To imitate the electric lamp is to acknowledge its superiority: why should the gas people wish to imitate it The inverted mantle burner is a positive improvement in gas lighting. It gives a somewhat higher absolute efficiency, and a better natural distribution of the light. These are good and sufficient reasons for its existence, and it has no need to make excuses by posing as an imitation. It is quite as susceptible of artistic treatment as the electric lamp, and the quality of its light is every whit as good.

The American manufacturer has apparently ceased to devote his constructive





A German Art Nouveau Design for Upright Mantle Burners

and creative abilities to the design of fixtures for gas illumination. As examples of American ideas therefore, either the fixtures that were designed years ago must be taken, or electrical fixtures which, by simple changes, could be adapted to gas lighting. In Europe the conditions are quite different. Gas lighting is still a subject for the best efforts of the fixture designer, and the prevailing ideas of decorative art as applied to fixture construction are found exemplified quite as much in gas fixtures as in electric. As we have stated before, the Art Nouveau school of decorative art apparently dominates the entire field in Europe at the present time, showing its influence in wall papers, carpets, tapestries, jewelry, in fact all articles which are subject to decorative treatment. Among the designs of lighting fixtures almost no other school of art is shown. The examples illustrated are taken from the catalogues of English and German manufacturers, and will give some idea of the lines along which foreign designers are working. Whether or not this school of design will become generally popular in this country remains to be seen. So long as the present tendency toward "period" furnishing continues it is obvious that all forms of new art will be held in abeyance. The motifs of this new school of art are so different from what we have been accustomed to that in many respects it appears strange, and possibly uncouth; but, like fashions in dress, familiarity soon removes such conceptions.

One Pipe Circuit Heating System

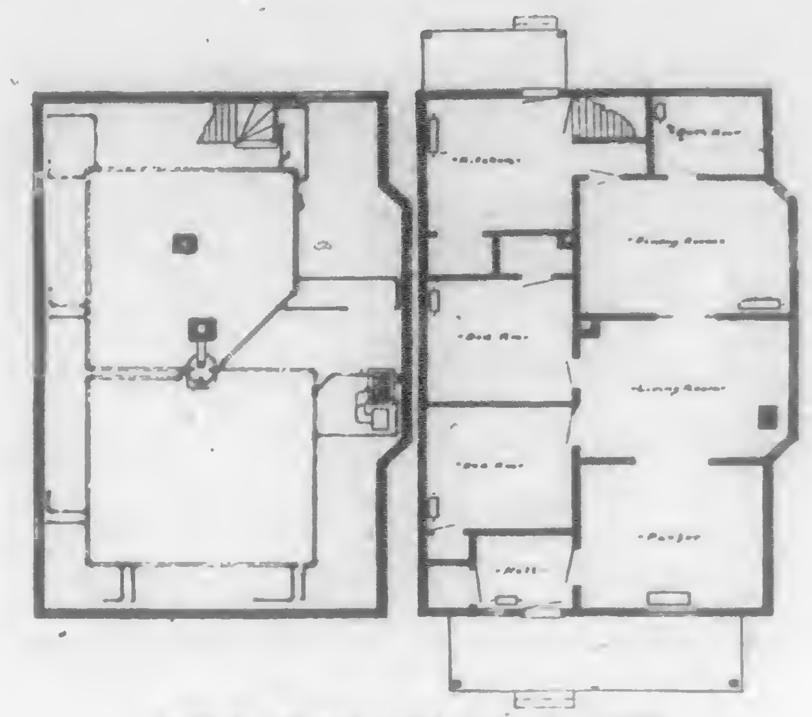
A heating system which, on account of its neat appearance and the use of less material, will appeal to many prospective builders and house owners is suggested by P. W. Rathbun in an exchange. The system effects no saving in cost, as larger pipe and fittings must be used, while with a two-pipe system of water heating much smaller pipe and fittings are used, thereby making the cost of both systems about the same at time of installation.

From an engineering standpoint the one pipe circuit system requires a wider experience, also considerable caution to perfect a proper installation. The flow main at boiler should rise up as near as possible to the ceiling of basement, circling around the entire or a part of basement to the return connection, at all times having a pitch of at least 1 inch in every 10 feet down in direction of return connection. All branches should have a pitch of ½ to ¾-inch down toward mains. Great care should be taken to see that the main equals the combined areas of all flow branches taken therefrom, and the main nowhere in the circuit is to be reduced in size, returning to boiler, same size as it leaves.

The greatest trouble with one-pipe systems now being installed is that the mains are, in many jobs, too small to give satisfaction and convey the proper amount of hot water to all radiators on the job. All flow connections should be taken off the main by the use of a reducing tee tilted to a 45-deg. angle or with opening facing up on which place a nipple with a 45-deg. or 90-deg. elbow, then run branch over horizontally to a point where a vertical riser connects to the valve at radiator. Return connections should be taken from the other end of the radiator, drop vertically, and then with a slight pitch down, run over to the side opening of the other tee, which should be placed in the main as shown right after the flow tee.

As will be noticed by radiation schedule, the author has figured a 38-inch dining-room radiator with warming closet, which is sure to pay for itself many times over by the convenience and comfort derived from same. In the living room indirect radiation has been figured to ensure good ventilation; indirect radiation is from a coil hung from the basement ceiling enclosed in galvanized iron boxing with connections to both cold and warm air ducts in such a manner that the cool, fresh air from exterior will enter and circulate around and through the radiator before passing into warm air duct and up into the room.

When figuring necessary boiler capacity, add 75 per cent. to indirect radiation and 50 per cent. to the actual direct radiation



Plan of One Pipe Circuit Heating System.

to derive the proper rating of the boiler required, which in this case makes a total capacity of 800 square feet of heating surface.

SCHEDULE OF RADIATION

Rooms	Height	Kind	Am't	Deg.
Reception Hall...	38"	Direct	35'	70°
Parlor	20"	Direct	84'	70°
Living room......		Indirect	140'	70°
Dining room, with warming closet..	38"	Direct	70'	70°
Front bedroom....	32"	Direct	40'	65°
Back bedroom....	32"	Direct	40'	65°
Kitchen	38"	Direct	70'	65°
Bath room........	44"	Direct	32'	75°
Total, square feet..................				511

Architect Eames Visits Coast

Architect W. S. Eames, of the firm of Eames & Young, St. Louis, Mo., one of the best known architects in the United States, paid a visit to San Francisco and Los Angeles in January. He is the architect of the new San Francisco Custom House. Several months ago Mr. Eames underwent a serious medical operation, and, for the purpose of recuperation, he has been taking advantage of California climate. Mr. Eames was president of the American Institute of Architects in 1904-5. At the present time he is chairman of several important committees in that body.

Big State Office Building

State Engineer Ellery of Sacramento reports that plans are now under way for a seven or eight-story Class "A" office building to be built on the corner of Fulton and Polk streets, San Francisco. Plans will be figured some time this spring. The building will house the Supreme Court, the Appelate Court, the Attorney-General, and all state officials now occupying hired offices in the city. The cost is estimated at $400,000.

By the Way

Some Industrial Information Worth the While

Standard Portland Cement Corporation

The Standard Portland Cement Corporation and the Santa Cruz Portland Cement Company are sending word to contractors and architects that they have taken over the exclusive sales agency of their cement, which has heretofore been handled by the Western Building Material Company. This means that they will market over 2,500,000 barrels of cement through their own efforts this year.

Realization of the magnitude of these plants came when it was learned that they had submitted a bid to the Government on 4,000,000 barrels of cement to be used in the construction of the Panama Canal, and it is understood that they have regulated their capacities to such an extent that they are prepared to fill large orders promptly without any advance notice.

The cement is being marketed along the Pacific Slope from South America to Alaska, and reaches many of the most interior points.

Recently some of the prominent eastern engineers have investigated this cement, and tests can be given by the San Francisco



German Old Peoples' Home—Oscar Haupt, Architect.

office at any time, showing the twenty-eight day tensile strength above eight hundred pounds, which is far beyond that of imported cements.

Now that these plants have become well established, construction architects and engineers throughout the coast, with one accord, are jubilant at having a home product that runs in uniformity as these two cements do.

In Larger Offices

The Los Angeles Pressed Brick Company announces its removal to more commodious offices in the Frost building at the northwest corner of Second and Broadway, Los Angeles. This company is now handling a great many varieties of clay materials and the steady increase of its business has necessitated larger quarters.

Builds Many Fine Residences

Among the contractors who have competed successfully for work in the office of Architects Bakewell & Brown is F. T. Edmans, treasurer of the Builders' Exchange, San Jose. In the past few months Mr. Edmans has built five houses for Messrs. Bakewell & Brown in Palo Alta. They are all double houses, and are for members of the University faculty. Other residences put up by Mr. Edmans are the O'Brien house in San Jose, designed by Architect William Binder; the Verrinder flats, at Fifth and Julian streets, San Jose, designed by Architect Schumacher; the Ginty house in the Neglee tract, San Jose, Wolf & McKenzie, architects, and the S. P. Hatcher home on Eleventh street, San Jose.

The Best in Plumbing Fixtures

The George H. Tay Company of San Francisco have recently issued a specialty catalogue upon the excellence of which they should be complimented. This book is most complete, containing illustrations of a full line of water closet combinations as well as a table giving the roughing in measurements of various types of closet bowls.

These catalogues are now being distributed among the architects and plumbing contractors.

Moves to Foxcroft Building

The California Peerless Stone Tile and Plaster Company, whose office and show rooms have been at 109 O'Farrell street,



San Francisco, for more than a year, has moved to more up-to-day quarters in the handsome Foxcroft building at 68 Post street. The company is doing a splendid business.

A. W. Curry's Sheet Metal Works

The sheet metal works of A. W. Curry, 116-118 Grand avenue, Portland, were established more than twenty years ago, and from the first have enjoyed a constantly increasing patronage. Once a customer of Curry, always a customer, seems to be the experience of this house, bred and trained in one of the Eastern states (Ohio), of whose citizens it is said that all they need to do is to stay there and wait and a good state or government office will seek them out. But Mr. Curry has no desire for eminence of that kind. He preferred the sheet metal business, and, like so many others, found his place in Portland. He is an expert in working corrugated iron, galvanized iron, iron and copper cornices, metal roofing, copper covered window and door frames, metal blast conveyor pipe for conveying waste or for heating, and drying or ventilating mills.

Some of Mr. Curry's important work includes metal cornices, copper covered window frames and hand hammered metal in the Failing building, Portland and the cornices, roofing and special hand hammered metal work on the Masonic Temple entrance in the same city. Several examples in the above buildings, other sheet metal men said, could not be done in Portland, but Mr. Curry "delivered the goods."

The Lennox Torrid Zone hot air furnaces for residences, churches and business houses are a very important part of his business also, he having put in more than sixty within a few months. Mr. Curry will be pleased to explain the superior merit of the Lennox furnace to any architect, builder or housekeeper that will write or telephone him.

New Catalogue of H. W. Johns-Manville Company

A new catalogue entitled "Pipe and Boiler Insulation," has just been issued by the H. W. Johns-Manville Co. of New York.

This book is devoted to a thorough presentation of the problems of insulating all kinds heated and cooled surfaces, such as pipes, boilers, furnaces, flues, ducts, etc., as well as insulation for refrigerating and cold storage work.

The book is the most complete one of its kind ever issued to the trade and bears out the company's idea "a covering for every condition." It is very handsomely illustrated and printed throughout.

A copy of the catalougue can be secured by addressing the company's nearest branch and asking for Catalogue No. 100

Cork Board Insulation

Architects and builders of refrigerating plants, breweries, etc., will be interested in a new method of cork board insulation introduced by the Armstrong Cork Board Company of Pittsburgh, Pa., and represented on the Pacific Coast by W. M. Whitten, 504 Williams building, San Francisco, and D. E. Fryer & Co., 305 Lumber Exchange building, Seattle.

Confined air, commonly classified as "dead air," is recognized by the leading engineers and architects to be the most perfect protection against the transmission of heat.

In the average cold storage construction there is opportunity for a considerable quantity of heat to pass through the walls, floors and ceilings. This is due to the great conductivity of the building materials used, and to prevent this a system of insulation is necessary. All heat entering a cold storage room must be removed by the operation of a refrigerating machine or the melting of ice. This means the expenditure of power and the loss of money. It is much cheaper to keep heat out of a building than to allow it to enter and then remove it, and money expended in obtaining the best insulation cannot be better invested.

Practical tests have demonstrated that granulated cork is the best commercial insulation before the public at the present time. Nature has endowed it with the necessary qualities to resist the transmission of heat; each granule of cork being a combination of minute dead air cells.

After years of experimenting the Armstrong Company is prepared to furnish cork boards consisting of granulated cork compressed into sheets of convenient size and thickness.

An Excellent Cement Coating

"How to Decorate and Protect" is the name of an attractive booklet just published by Wadsworth, Howland & Co., manufacturers of the original Bay State Brick and Cement Coating. A copy of the book will be mailed free to readers of this magazine by mentioning same and addressing any of the Pacific Coast distributing agents, whose names appear in the company's advertisement on another page. The book is profusely illustrated and many of the buildings shown are in California. The cuts give some idea of the different uses for the cement coating, ornamentation and protection being afforded all kinds of construction. Bay State Brick and Cement Coating can be applied on cement and concrete which is damp, yet not be affected, either on interior or exterior work, and is not dependent on a binder that deteriorates. It is composed of a cement base, held in suspension by a volatile oil which evaporates on application.

Steel for Hotel Annex

Among the important late contracts the Pacific Iron Works have secured is the steel frame for the class A structure to be erected by the Oregon Hotel Company as an annex to their present building, for which D. L. Williams is the architect. The building will be 50x100, and six stories high, and built in a manner to sustain four more stories at a later date.

The Architect versus the Electrical Contractor

To the Editor of the Architect and Engineer:—Of the many trades and industries which figure in the construction of a building, there are few, if any, that an architect or general contractor is less familiar with than the electrical business.

In the first place the architect has no "Kent" or "Haswell" to refer to as in the case of steel work. It is, therefore, the duty of the man who understands the electrical business to assist him in every way possible.

But the architect must use judgment in the selection of his electrical contractor.

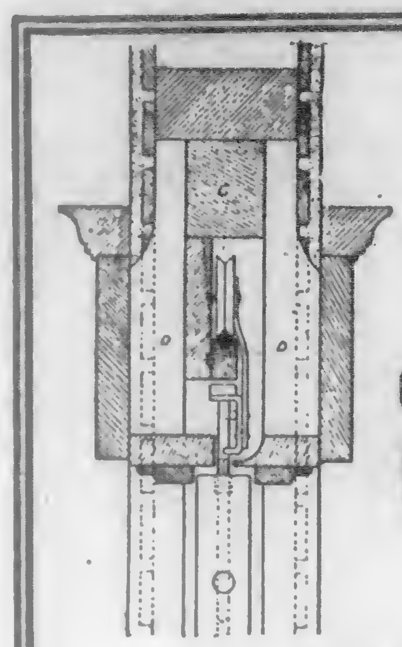
With due respect to the architects, my opinion is that more attention should be paid by the majority of them to electrical work, especially for large office buildings and fine stores. Do not depend on the fixture man to tell you how many lights will do the work. Of course the electrical contractor has a great deal to do in getting the proper results, and it is most important that the architect knows who he is dealing with.

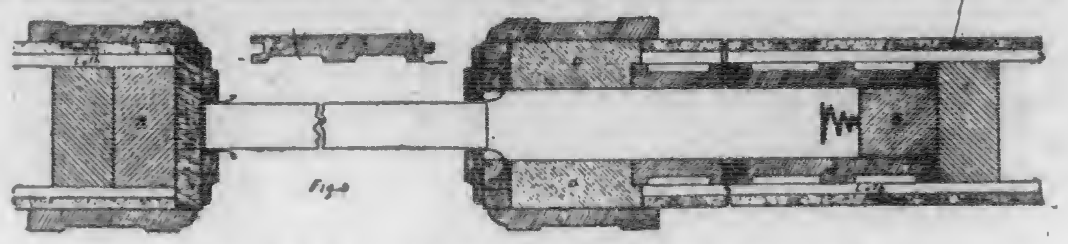
Any one can pull a wire in a conduit, but to know the size conduit and wire to get the required results is another thing. A feed wire that is too small will do more damage than not enough lights. The "gripsack" electrician (the reliable contractors' worst competitor) does this class of work. As a rule, he is an electrician out of a job, and he goes into the "contracting" business. He is the man that puts in any size wire for any class of work. To get results you must have a reliable man, a man who knows the whys and wherefores. It was brought to the writer's notice not long ago where a "gripsacker" figured alike all motor wires; that is, 2-phase, 3-phase, 3-wire, etc. This again shows the importance of the proper man to do the work, if proper results are to be had.

The first class contractor does not work for an architect, but with him, and that reminds us of the trite maxim, "In Union There Is Strength." LIGHT.

Lilley & Thurston Get Important Contract

The Lilley & Thurston Company, in competition with the Kahn system and others, has been awarded a contract by Architects Goodrich & Goodrich of Portland, for the reinforcing steel for the new public market. The system to be employed is the General Fireproofing Company's girder-frame for reinforcing. The Lilley & Thurston Company are the exclusive Pacific Coast representatives of this material. The Portland contract is an important one, amounting to about $30,000.





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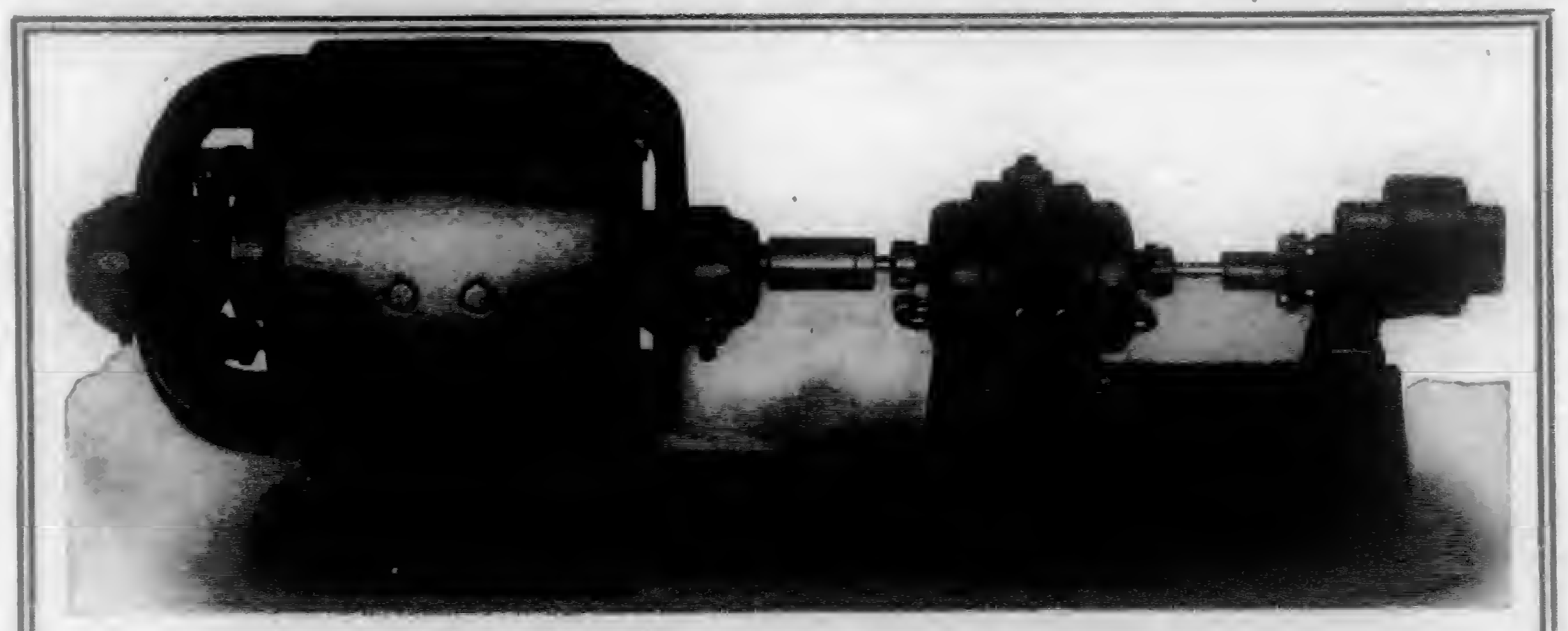
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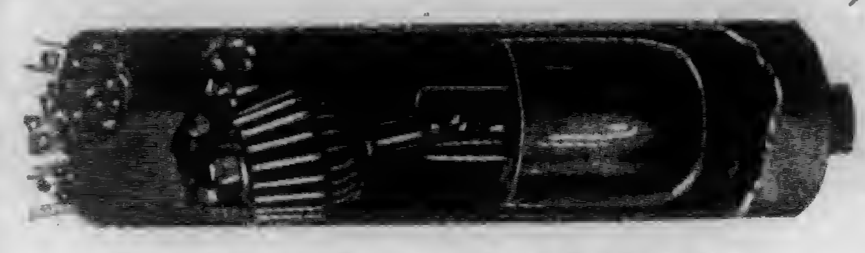
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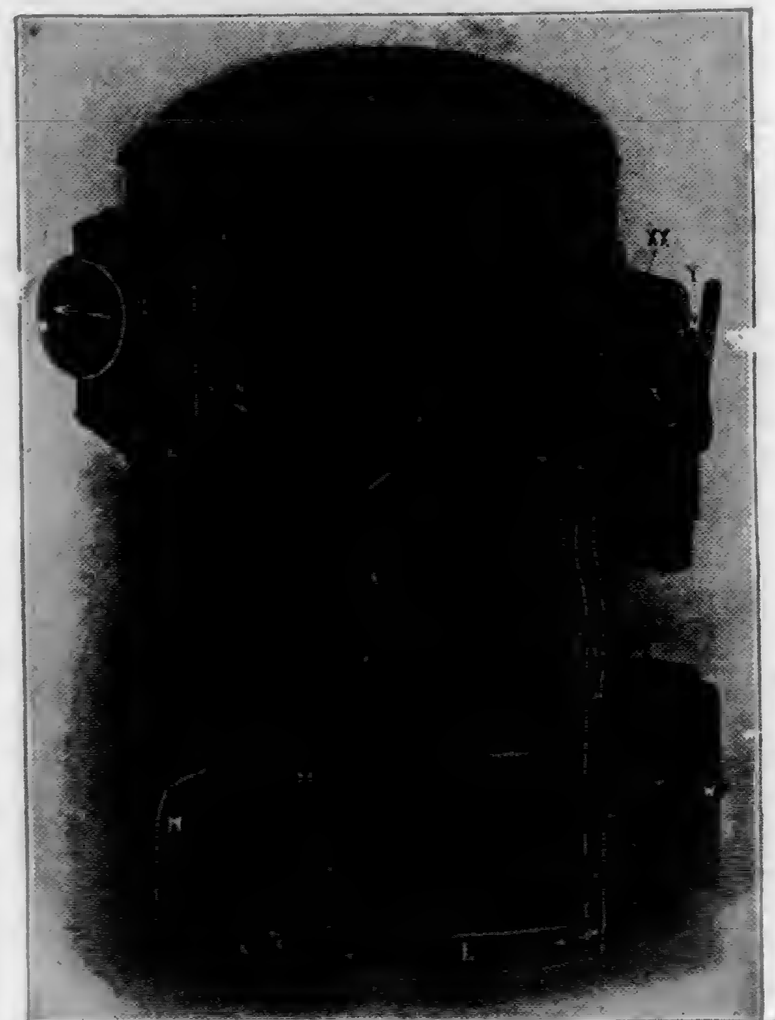
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The Oregon Art Tile Company

A. G. Whiteman of the Oregon Art Tile Company says the year 1908 treated his concern very well, but he expects 1909 to do even better. "We have reorganized our business" sa'd Mr. Whiteman in an interview, "and have moved our offices and salesrooms to the Knights of Pythias building, 413 Alder street, where we have abundant room for displaying our samples. Two of our lately completed jobs of ceramic mosaic tiling are the offices, lobbies, vestibules, corridors, lavatories, baths and bar in the new Chandler hotel, Marshfield, Oregon, and the new First National Bank building at Lewiston, Idaho. In the public space in this building we used a one-inch Hexigon pattern with a green and white Greek border. Both jobs received much praise from the owners and the public.

"We have also secured the Dayton hotel at Dayton, Washington, and the remodeled Swetland building in Portland. In this we will use a unique design in dark rich cream, the center shaded to white. The border will be of Celedon with green and white in a special design.

"We have just received some very choice exclusive designs in faience and dull finish tiles, especially for fire places, which are now so much used in the new residences."

Has Contract for Fire Cisterns

The Keystone Construction Company of San Francisco and Oakland was successful in competing for the contract for building eight concrete cisterns in connection with San Francisco's new auxiliary fire plant. Each cistern will have a capacity of 75,000 gallons of water. The Keystone Company has recently finished the construction of a reinforced concrete single span bridge at the State University, Berkeley. It is a splendid piece of workmanship. Architect John Galen Howard designed the bridge The same company did the foundation work for several Oakland and Berkeley residences, and laid out the streets in a number of real estate tracts in the vicinity of Piedmont.

An Index to the Advertisements

[Index continued on Page 108.]

Work of the Western Electric Works

The Western Electric Works rank foremost among the many business enterprises of Portland, Oregon, that have exceeded all original expectations. This concern commenced business about ten years ago in small quarters on Washington street. Since then the firm has changed its location to Sixth and Pine streets, and during the past year a large two story factory at Sixth and Salmon streets has been erected, at which place the manufacturing and installation part of the business is given attention.

The original store at No. 61 Sixth street is now paying particular attention to the supply and fixture trade. Here the company carries a large stock of standard and electrical supplies, besides an elegant line of electric and combination fixtures of latest designs.

The traveling representative is kept constantly on the road and the supply business is rapidly covering all the Northwest.

This concern can justly point with pride to the record achieved in the electrical installation line. Among the many large contracts are the following: U. S. Custom House, Scottish Rites Cathedral, Portland hotel, Marquam theater, the new Corbett building, and the new Commercial Club building, all in Portland, and the Government barracks at Vancouver, Washington, besides several municipal plants installed complete throughout Oregon and Washington.

The new factory is one of the best equipped on the coast for the manufacture of switch boards, panel boards, and steel boxes, and the output in this line is rapidly increasing. Mr. W. O. Fouch, who has charge of the construction and manufacturing end, has devoted years to the electrical business, and understands it from A to Z.

C. K. Claggett, Electrician, Portland

C. K. Claggett established himself in Portland as an electrician four years ago, and in this short time has secured a remarkable hold on the confidence of Portland people. Compelled to seek larger quarters several times. He is now at 74 Sixth street.

Among the importantt jobs secured by him in the wiring of the $20,000 residence for H. L. Chapin, East Sixteenth and Wasco streets, the fine residence of Mrs. Ruby at East Nineteenth and Multnomah; the Donohue $15,000 cement block residence at Walnut Park, which he wired and fitted for electric lighting, heating and cooking, and the handsome Scott residence.

Book Review

Asphalts, their sources and utilizations. Asphalt for dustless roads, recent improvements in asphalt industries, together with addenda treating on general waterproof construction. By T. Hugh Boorman, civic engineer and asphalt expert. New York: William T. Comstock. One 8vo vol. Cloth. Price, $3.

This work has been brought out as a manual and general reference on asphalt, its characters and uses.

The author first treats of it in reference to pavements for city streets, but also treats at length its application to country roads to secure a good permanent road bed free from both dust and mud.

This use of asphalt and asphalt oils has grown largely, of late, promoted, no doubt, by the general use of the automobile.

The various specifications for the use of asphalt will be found of great value to the municipal engineer and roadmaster.

The author has not, however, contented himself with treating of these two main uses of the material, but refer to its use in waterproofing, roofing, the manufactures and industries.

One of the earliest waterproofing materials known to man, it still continues to be one of the best.

The book will be found a complete and careful guide in the use of asphalt and of great value to the architect, engineer, manufacturer and municipal officer.

To Specialize in Heating

Henry T. Maddern, a pioneer plumber of Oakland, is making a specialty of steam and hot water heating, and some of his recent installations include the residence of F. L. Johnson on Monte Vista avenue, Oakland, the McGregor apartments at Ninth and Madison streets, Oakland, which are equipped with a circulating hot water system costing $8,000; also the residence of A. R. Dirge at Berkeley, the Christenson apartments at Eighteenth street and Lake Shore avenue, and many other residences and business blocks.

ADVERTISERS' INDEX—Continued from Page 105

More Anent the Sub-Contractor

To the Editor of The Architect and Engineer: I read with great interest, in your last issue, of "The troubles of a sub-contractor." Truly, the sub-contractor, in San Francisco, is the fruit of the earth.

The troubles mentioned by your contributor have existed to a limited extent for a number of years, but have been added to, expanded and rubbed-in by the flood of Eastern construction companies brought into our midst by the recent disaster.

A business practice peculiar to San Francisco: taking sub-contracts by word of mouth is still in vogue, and is dependent upon the honor of the contracting parties. A few years ago, before the fire, a general contractor would get his sub-bids, base his figures on them and feel duty bound to let the jobs to those sub-contractors whose estimates he used. These recently arrived "construction companies," with their magnificent organization they boast so much of, lit up our firmament like the proverbial skyrocket, and are now coming down like the also proverbial stick.

This evil practice has grown on the building fraternity and as a consequence the class of work being done can not compare with that done "on honor" before the fire. The only help I see is for a more general seg-













regation of the work in building construction and the letting of separate contracts for each item in the structure. This has become very general in the lines of plumbing, painting and foundation work. These are three lines the architect feels he can not trust to the cupidity of the contractor for each of them may be "skinned" while he is looking on, and he not know it.

I hope you will use your good offices in assisting the down-trodden sub-contractor to gain the justice that is his due.

Very truly,

HARRY LARKIN.

San Francisco, January 25, 1909.

Chas. F. Beebe Co.

The Chas. F. Beebe Co. of Portland are pioneers in the marine hardware and ship chandlery business in that city, having been established there since the spring of 1884. The company recently added to their stock a complete line of contractors' specialties, including the well-known Smith concrete mixer, contractors barrows, shovels and, in fact, everything that a contractor would want.

They have recently moved into new and much larger quarters at 46-48 Front street. where their big show room on the first floor is used to exhibit the high-grade specialties which they are handling. They will continue to handle foundry supplies.

The Efficiency of Brick

(Contributed by the Ceramic Club of San San Francisco)

IN these times of great building activities, the matter of first importance to the general public is the efficiency and merit of the various building materials now being presented to those intending to invest their money in the construction of buildings.

As a building material, coming down to us from the very earliest age of the world's history, the efficiency of burnt clay products over all other materials has been practically demonstrated by the experience of centuries. It is a fact, that good hard burnt brick, properly anchored and bonded with good mortar, is a fire resistant infinitely superior to anything else that has yet come under the observation of man.

A steel frame building, which frame supports the weight of the different floors, is conceded to be the most modern design of architecture.

This class of building, to be made absolutely fireproof, must have its outer walls built of some incombustible material, preferably brick, its columns also protected, and its floors and partitions correspondingly fireproofed.

Such is the opinion of the most noted architects and building engineers in this country.

The resisting power of brick in fire was very forcibly demonstrated in our great conflagration of 1906.

We need only refer to the Palace Hotel. This building was constructed in the seventies, and the foundation as well as the outside and inside walls, were all of brick construction. The girders, beams, floors, windows and doors were of wood; steel frame construction not having been in use when the hotel was built.

The fire was intense in the vicinity of this building. It destroyed the wooden interior, but the brick walls proved an impregnable fortress to the attack of the fire, and they stood firm and sound against the flame.

Many other great massive building walls of brick withstood the ravages of the flame, such as those in the Hotel Alexander, St. Ignatius Church, Flood Building, Temple Emmanuel, St. Mary's Church on California street, St. Rose's Church, Hotel Holland, Pacific Telephone building, Crocker building, St. Francis Hotel, California Casket Company building, Call building, Kohl building, St. Patrick's Church, and many others, all of which afford a practical and most convincing argument of the efficiency of brick as a fire resistant material.

Brick is a product of heat, and to burn properly a good hard building brick in a kiln, from 1600 to 2500 degrees of heat is required. This fact alone proves its fire resisting qualities.

Not alone as a fireproof building material is the merit of brick and other burnt clay products confined.

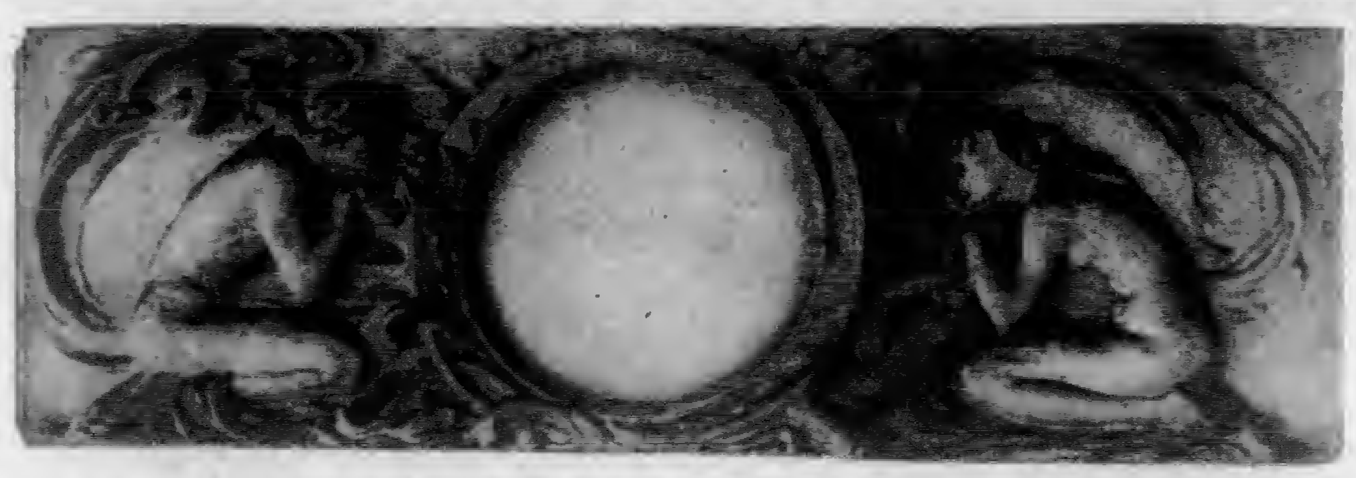
The manner in which brick structures held firm against the shock of the great earthquake of 1906, is a monument to their efficiency in this regard.

The buildings heretofore referred to, showing the efficiency of brick as a fire resistant, also withstood the earthquake with wonderful stability.

Had the fire not followed the earthquake the damage to the buildings named would have been very slight.

Many brick buildings throughout the city, which had not been reached by the fire, withstood the force of the quake without damage.

In proof of this, a reference to a few such buildings will suffice.





The U. S. Government brick barracks buildings at the Presidio Reservation. The row of brick buildings on the southwest corner of Jackson and Sansome. The row of brick buildings on Jackson, between Sansome and Montgomery. Also many of the brick residences in the Western Addition, where no damage was done to the brick walls.

The U. S. Appraisers building, covering one-half block, between Jackson and Washington, Sansome and Battery, built of brick, stood after the quake a monument to honest brick work.

St. Mary's (Catholic) Cathedral, one of the largest and most magnificent church edifices in California, of brick construction, and located on Van Ness avenue.

Portland Sheet Metal Works

The Portland Sheet Metal Works at East Seventh and East Madison streets, Portland, Oregon, is a busy plase, and the proprietor Mr. Reuter, has since January first nearly doubled the size and capacity of the factory which was previously very large and important and filled with fine expensive machinery, much of it automatic, and all driven by electric power, in fact right up-to-date, if not a day or two ahead. In architectural and ornamental sheet metal work this house is particularly strong, and has a very important business. In fireproof metal windows and doors alone they make more than ten standard types, as well as any special design suggested by any architect, in fact they are constantly at work on special designs.

For the new six story Moy Bak Hin Chinese building they made over 300 fireproof metal windows, every window in the building and most of them special designs, also all the sheet metal work on the Lombard building; have the order for all the F. P. windows and copper work for the new ten story Meier & Frank building, also have just completed a large order of metal windows for Tacoma, Washington, and another large order of metal windows and doors for the Ashland Creamery, at Ashland, Oregon.

They have a large and elaborately illustrated catalogue which is free for the asking to all architects and intending builders.



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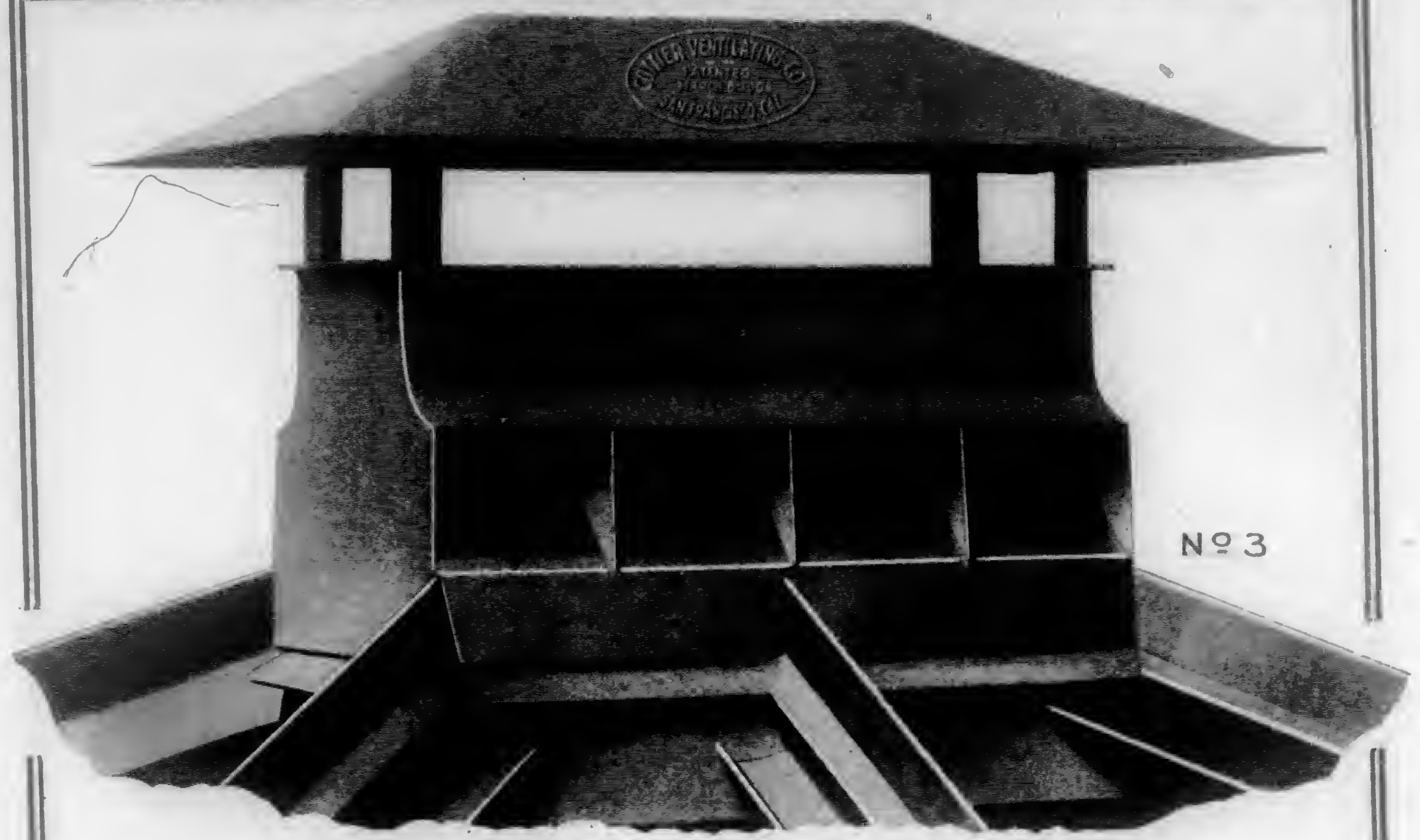
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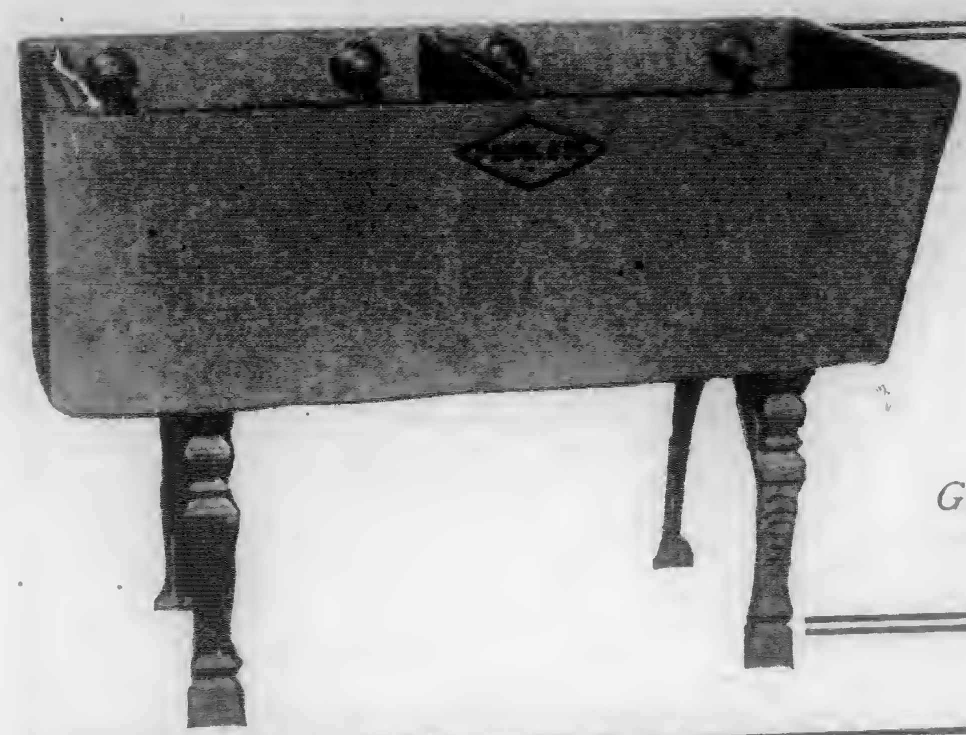
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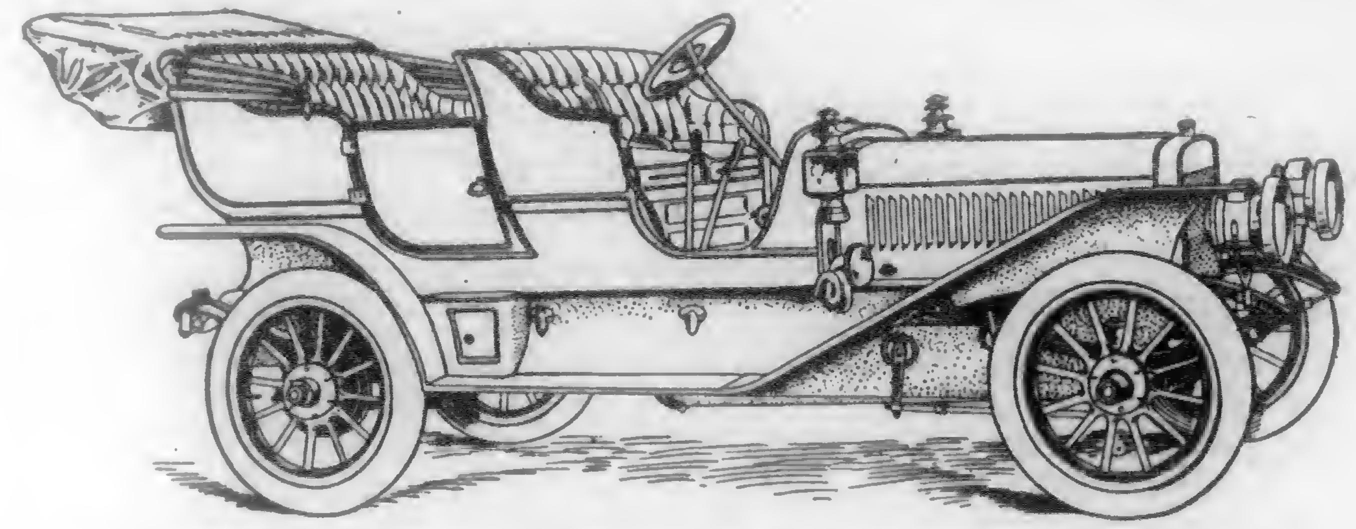


Forced to Make Six-Cylinder Cars

For several years Mr. Winton has known six-cylinder cars to be superior to fours. But originally he did not anticipate marketing a six until about 1910.

His belief was that the public would not be ready for sixes until then; and you know how unwise it is to try to hurry public opinion.

Well, after marketing the four-cylinder Winton Model M in 1907—a car that to this day has no superior among fours—and finding buyers clamoring for a new merit that fours could not satisfy, Mr. Winton had no alternative. He was forced to make and market the



WINTON SIX

two years ahead of his schedule.

Then the four makers smiled knowingly. In their opinion it was a foolish thing to put all one's eggs in the six basket.

That was more than a year ago.

Today nearly every maker who isn't marketing a six is either wishing he were, or is experimenting with one in the hope that he may produce a six to equal the self-starting, sweet-running Winton Six.

Men who own Winton Sixes enjoy a contentment that no other car ever gave them.

That's why the Winton plant is working full force, full time, and is still behind orders.

If you want a new satisfaction in motoring, we suggest that you place your order early.

Our booklet, "Twelve Rules to Help Buyers." tells how to compare cars of all makes, styles and sizes. Another booklet, "The Difference Between Price and Value," tells what you pay for when you buy a car. Both books sent upon request.

The Winton Six carries no starting crank in front. Starts from the seat without cranking.

So flexible that gear-changing is seldom required.

Quieter than nine-tenths of the electrics you pass on the street.

Goes the route like coasting down hill.

Beautiful in its lines, superb in the character of its design and the quality of its material and workmanship.

Precisely the car for the man who seeks the best there is.

Made in two sizes, with various body designs. Five-passenger, 48 h. p. Winton Six touring car $3000. Seven-passenger, 60 h. p. Winton Six touring car $4500.

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A SAMPLE TESTIMONIAL

SALEM, OREGON, March 10, 1908.

Gentlemen:—
This is to certify that the county of Marion has used Oregon Sienna Mineral Paint the past year for bridge work, and we are pleased to say that it has given entire satisfaction in every respect. The steel bridge across the Willamette River at Salem was given one coat of your paint last year, and although the bridge had not been painted since it was built 16 years ago, the one coat filled the voids caused by rust, and it looks as if two coats of ordinary paint has been applied. The job looks remarkably well, and we take pleasure in recommending it to all who want a first class paint.

Very respectfully,
JOHN H. SCOTT, County Judge.
I. C. NEEDHAM, County Commissioner.
W. H. GOULET, County Commissioner.

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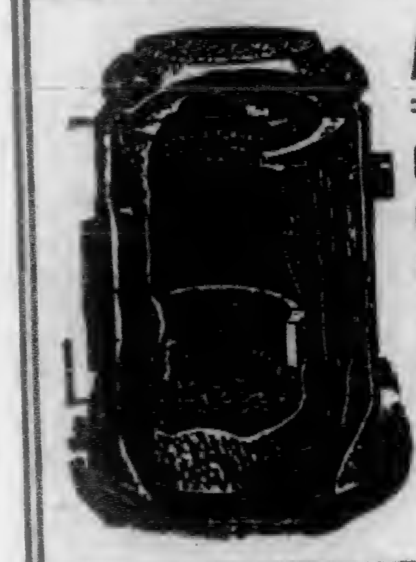
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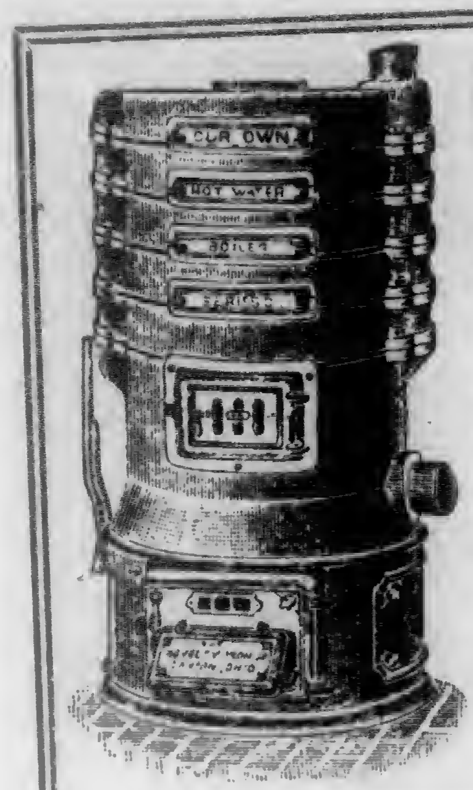
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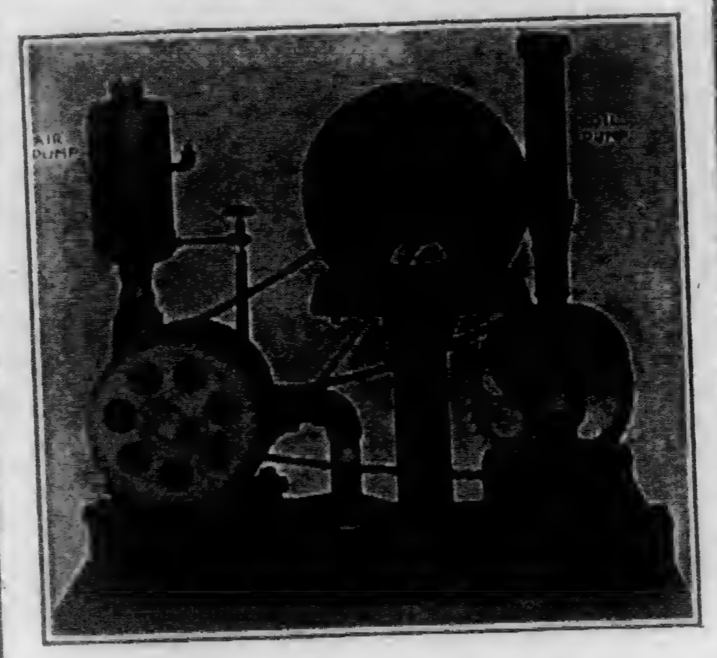


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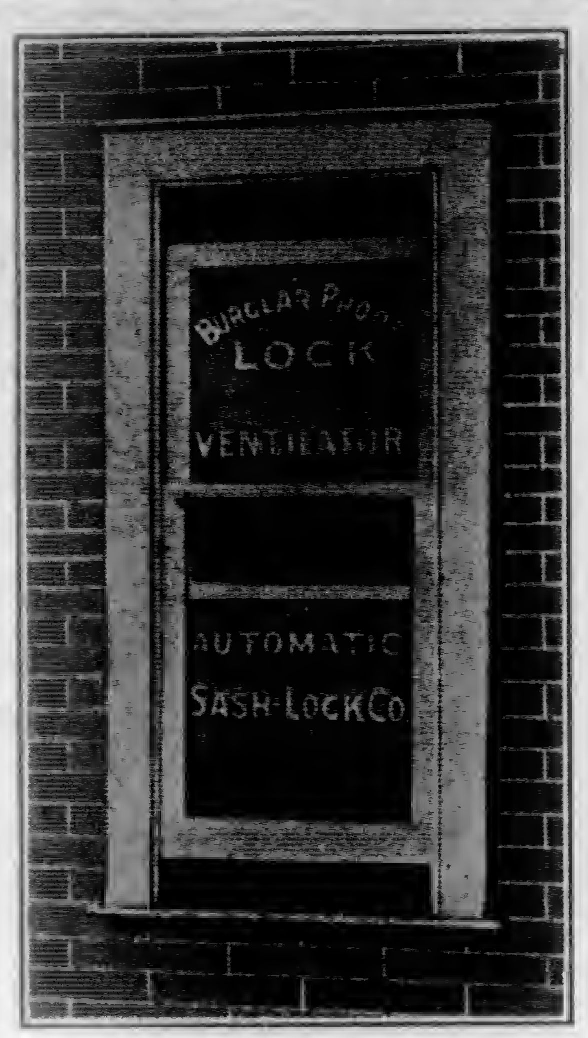
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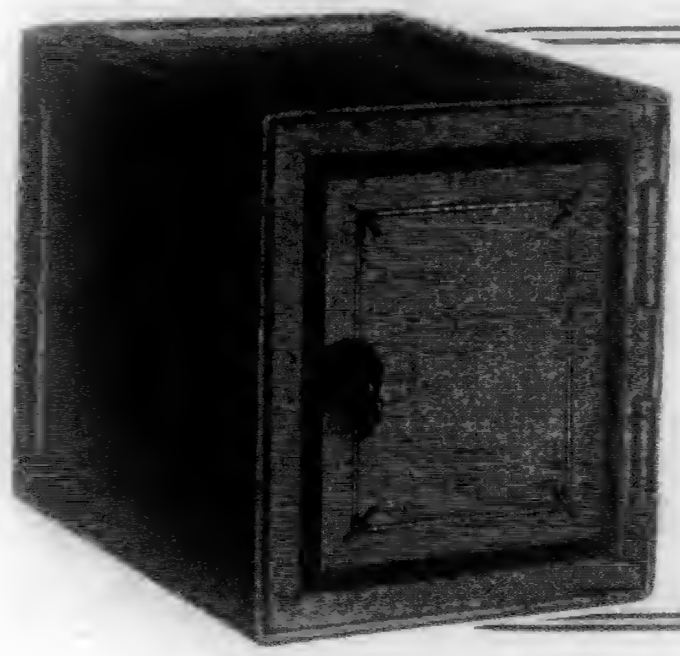
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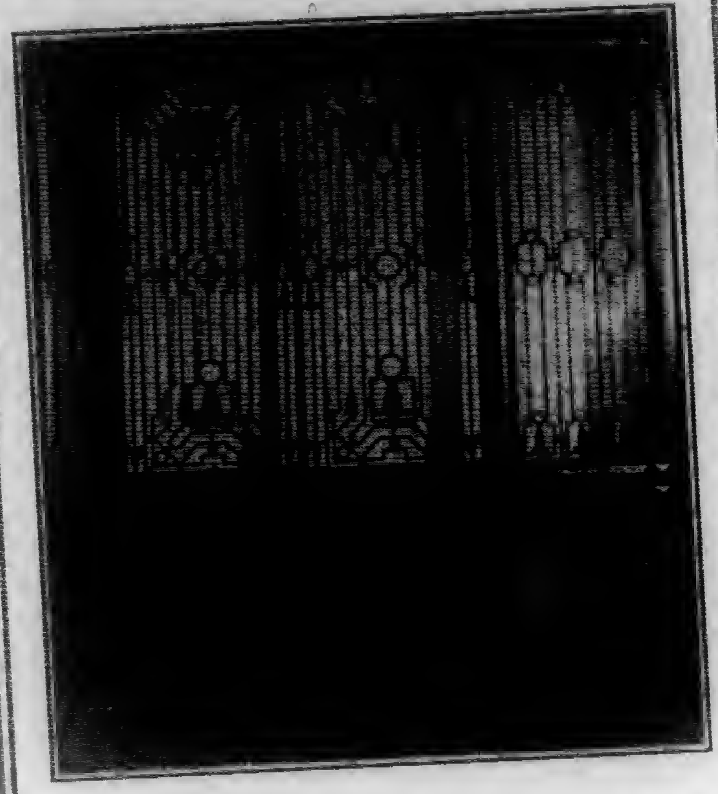
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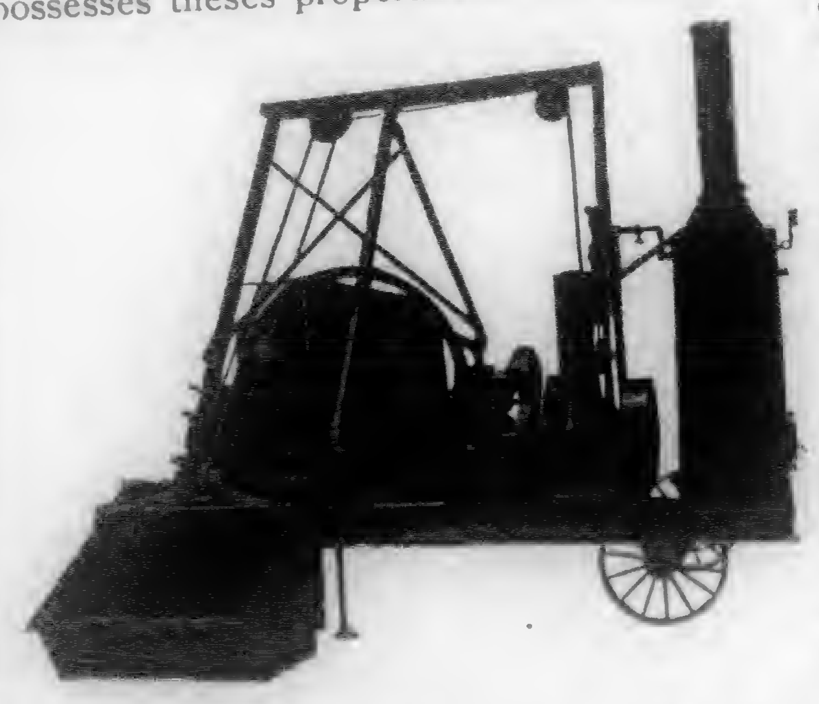
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The Architect and Engineer

of California

Pacific Coast States

Contents for March

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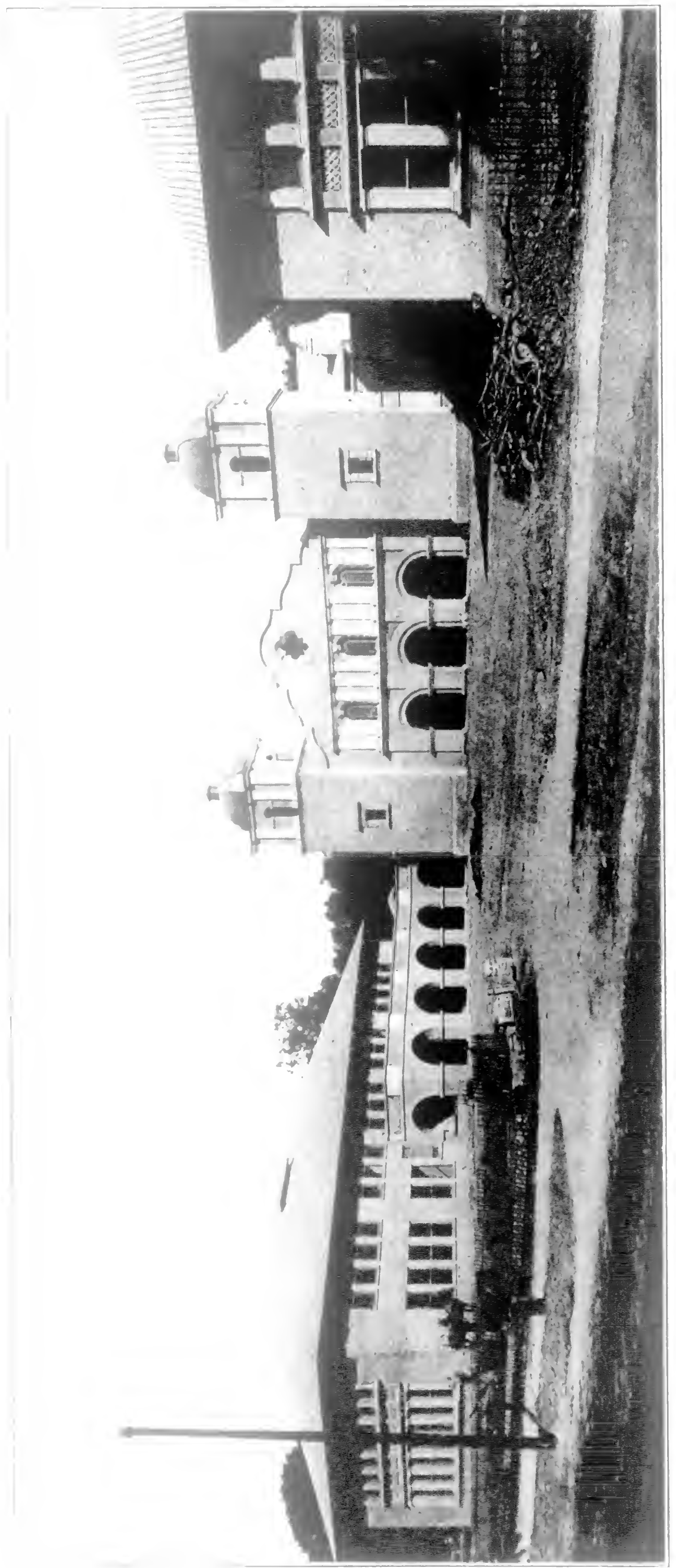
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Issued monthly in the interests of Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast.

Contents for March

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F. S. Allen, Architect

Frontispiece,
The
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March, 1909

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XVI. MARCH, 1909. No. 2.

The San Jose High School a Striking Example of the Mission Type

By F. S. ALLEN, Architect



After a careful, comprehensive study of the climatic conditions of the California Coast, the Franciscan Fathers decided to adopt a type of architecture somewhat resembling the ecclesiastical buildings of their old home. Due to the fact that the greater portion of the labor necessary in the construction of their many Missions, established in the latter part of the eighteenth century, was to be that of the native Indians, it was readily apparent that, in order to gain the best results at the earliest possible moment, it would be essential to use materials that could be handled successfully by these unskilled workmen.

Their first structures were built largely of adobe or sun-dried bricks; later they established brick yards and taught the Indians the art of brick burning and in some instances, where a soft sand stone was near at hand, they opened quarries and constructed their buildings of stone. The occasional earthquakes which they experienced also became an item of consideration.

Owing to these several conditions, their buildings were low and rambling, often built in groups; the exteriors were plain and massive with few openings. They frequently contained one or more large court-yards or patios, in the center of which was usually a fountain. Around these patios, ran long, low arched cloisters, affording shelter from the rain in winter and from the sub-tropical sun in summer. They also served as hallway or passages from which entrance was gained to the various rooms; a condition of affairs practicable only in a climate such as the California coast possesses. But more picturesque and striking was their use during the sacred and solemn processionals of the Church, the acolytes, one holding aloft the impressive symbol of salvation, the other swinging the incense cup, followed by the long-robed Franciscans in all their dignified vestments, chanting the solemn hymns of the holy church; with the procession made complete by



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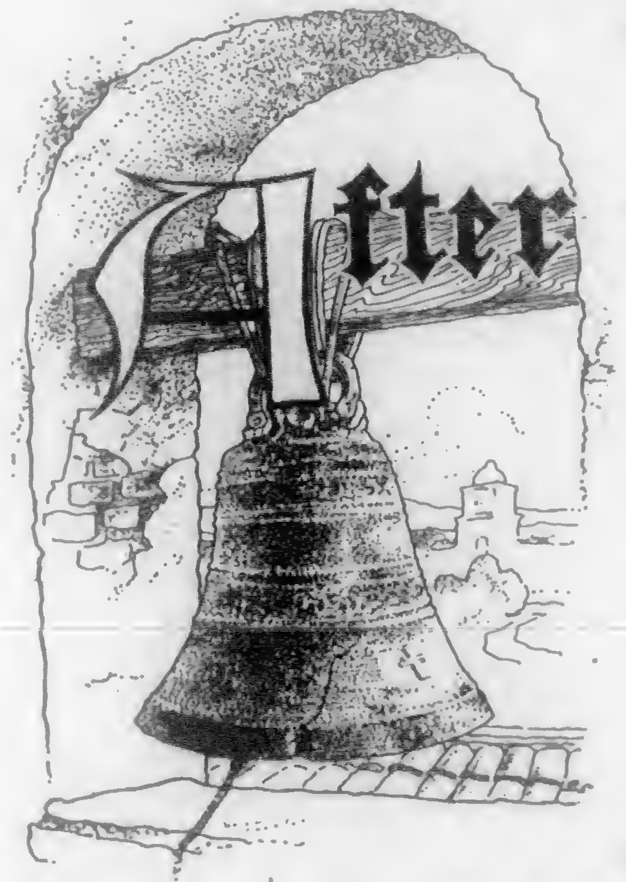
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High School, San Jose—The Assembly Hall

F. S. Allen, Architect



High School, San Jose—One of the South Cloisters

the dusky-faced Indian men, women and children. This indeed was a striking use of the cloisters.

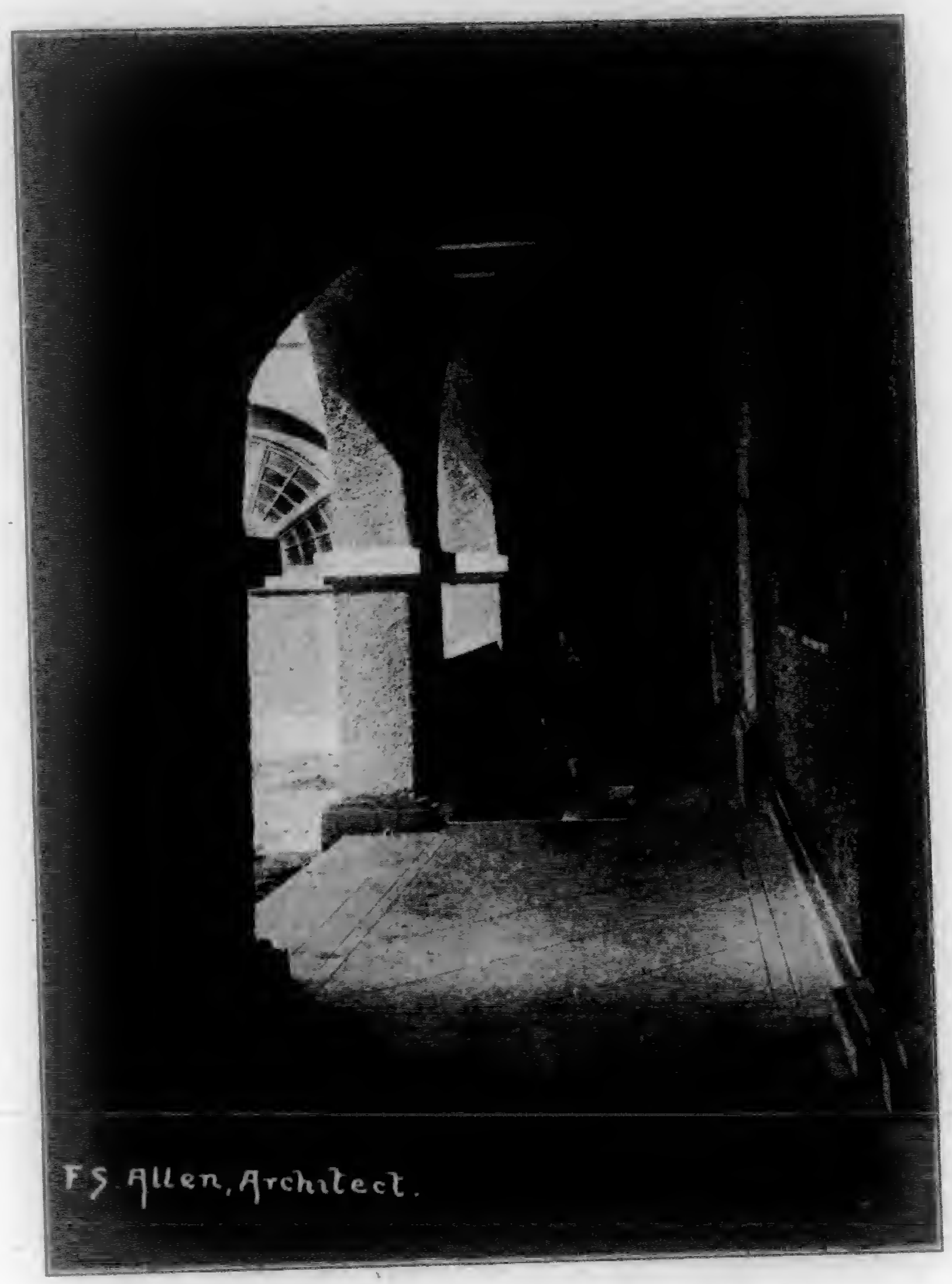
The walls were necessarily thick, and as the adobe bricks were more or less damaged by the severe winter rains, the builders soon saw the advisability of protecting them with a heavy coat of plaster made from coarse gravel and the natural cements found in the vicinity. The scarcity of skilled labor made it impossible to use much ornamentation; consequently, with but few exceptions they did not attempt anything in the way of mouldings or carvings. The interiors were decorated to some extent with canvases brought from Spain and crude frescoes painted by some of the more artistic priests.

Within the last decade the people of California have come to recognize the expediency of perpetuating this early style of architecture and to see in it many advantages not found in the types of construction requisite in more severe climates. Many buildings, both public and private, are now patterned after the ideas of the Mission fathers. This is particularly true of the public schools which, with their large rooms and the necessity of



F. S. Allen, Architect

High School, San Jose—The Assembly Hall

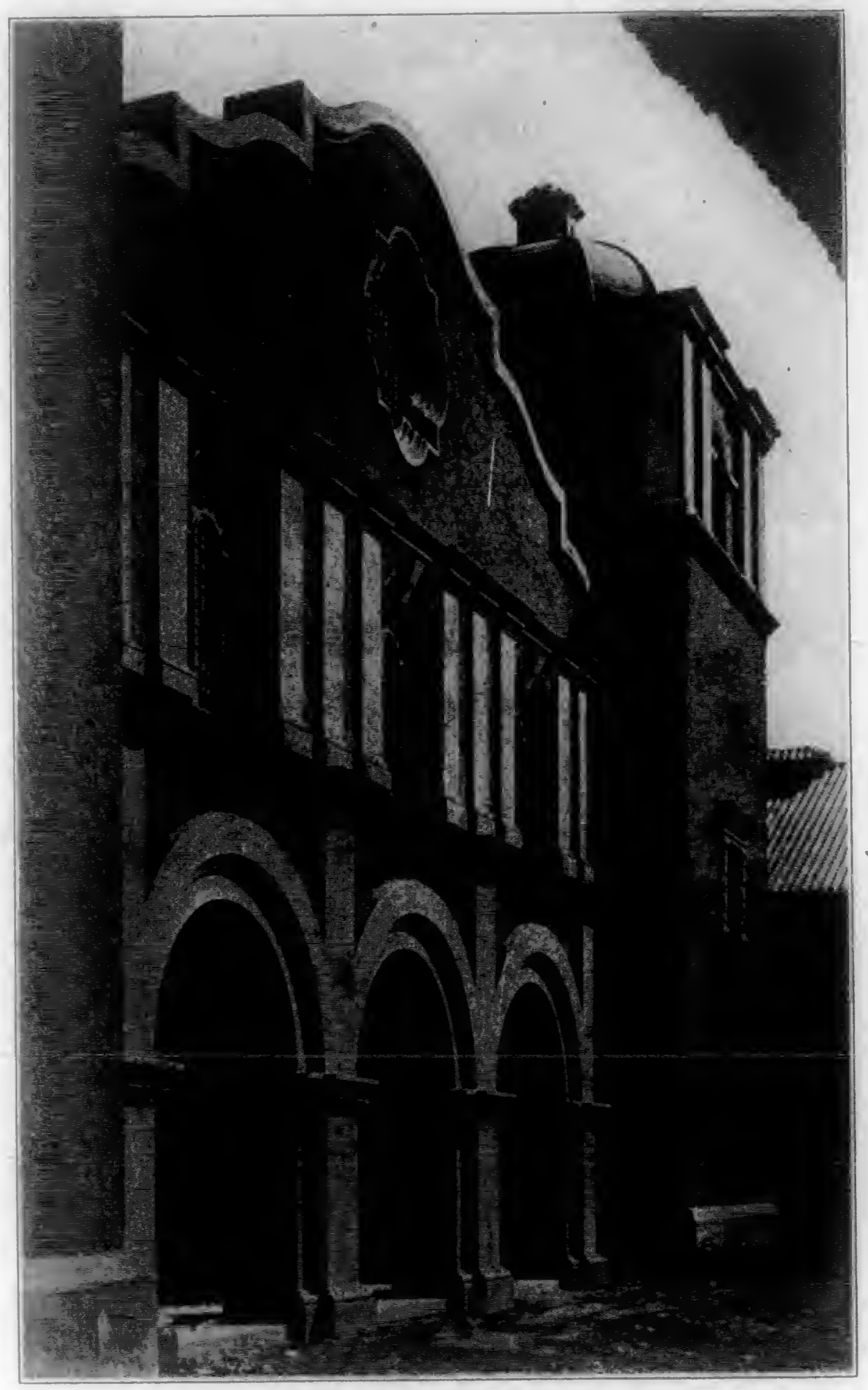


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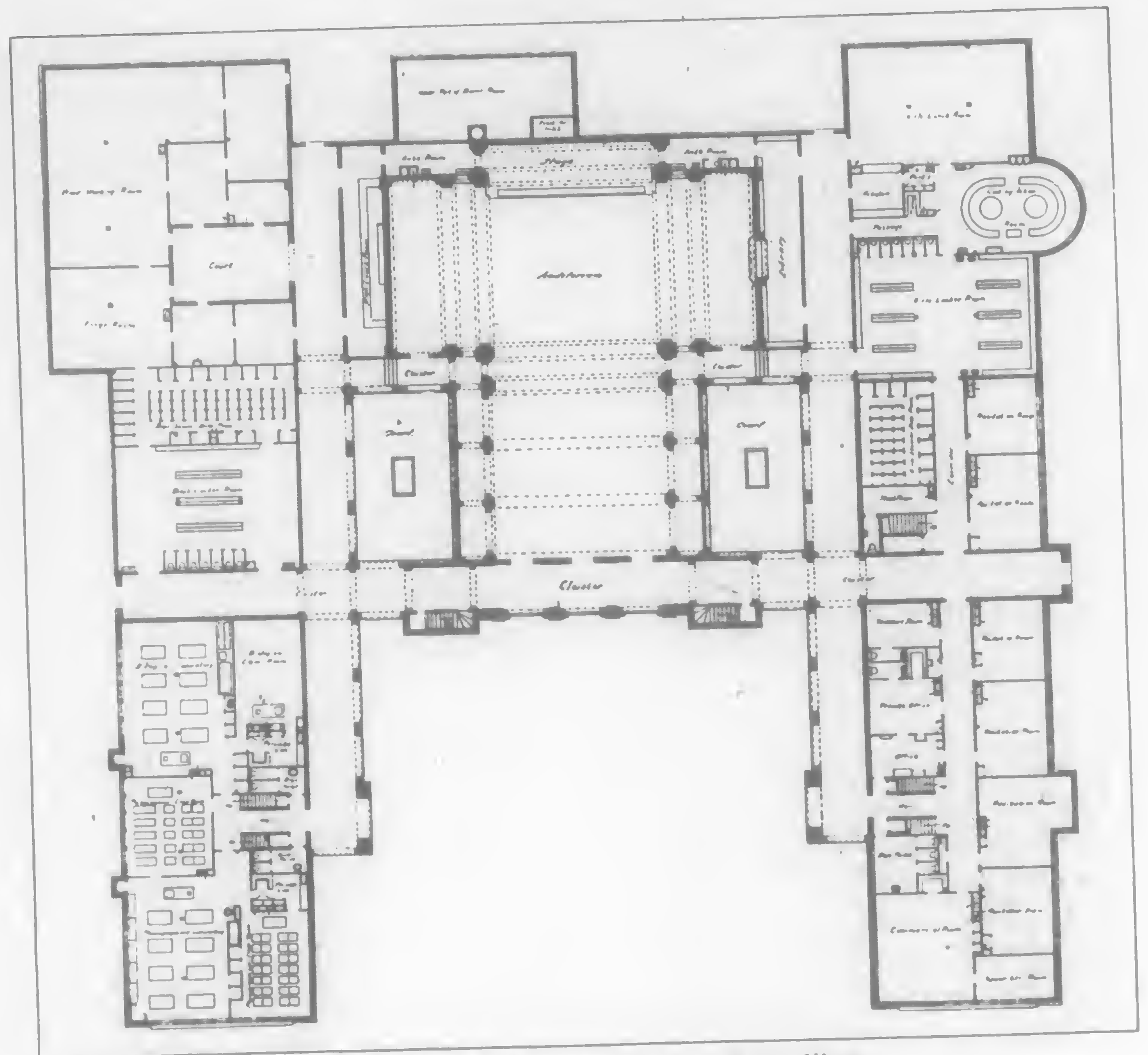
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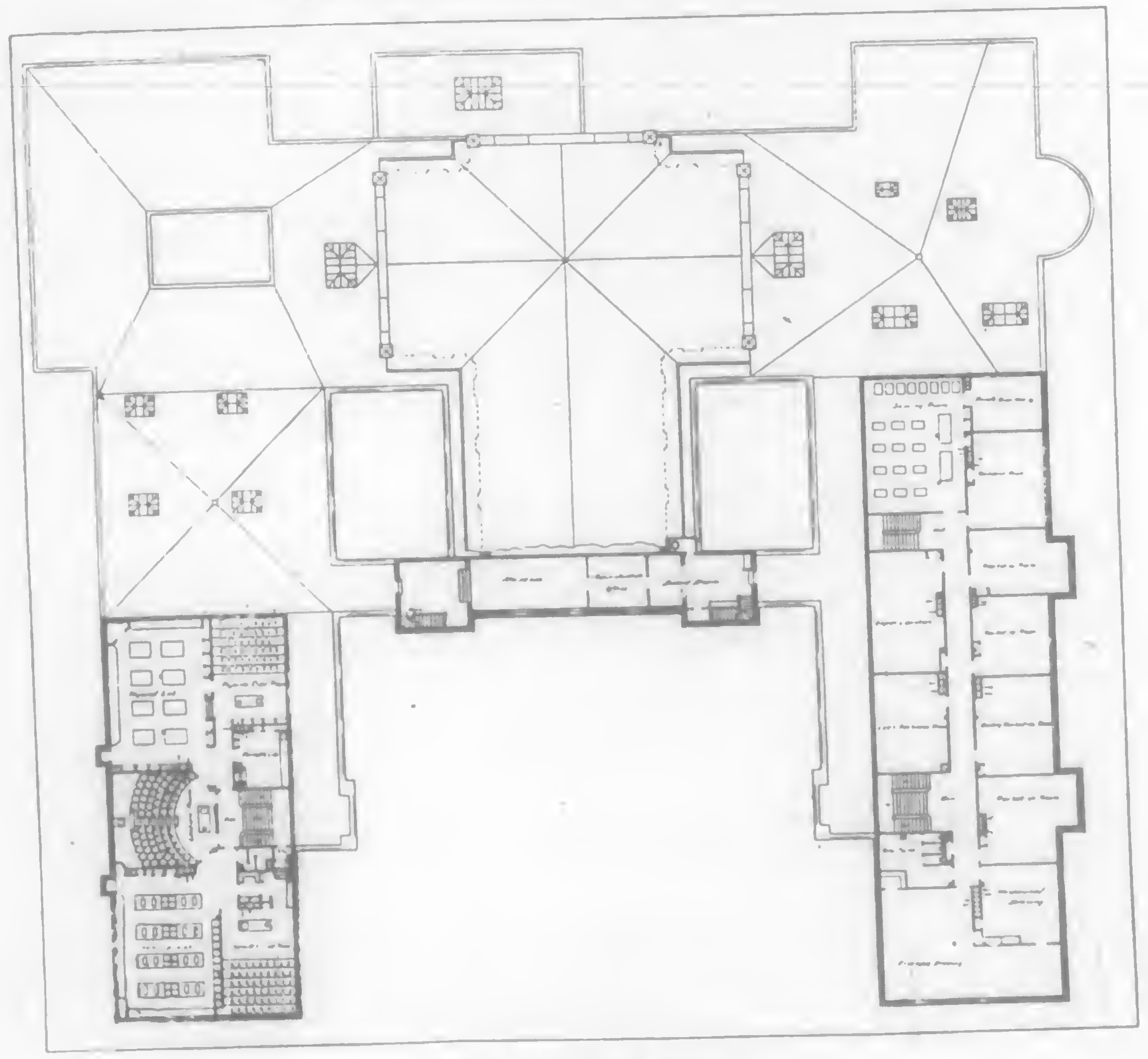
High School, San Jose—The Main Entrance
F. S. Allen, Architect

wide and extensive passages, lend themselves most admirably to this manner of building.

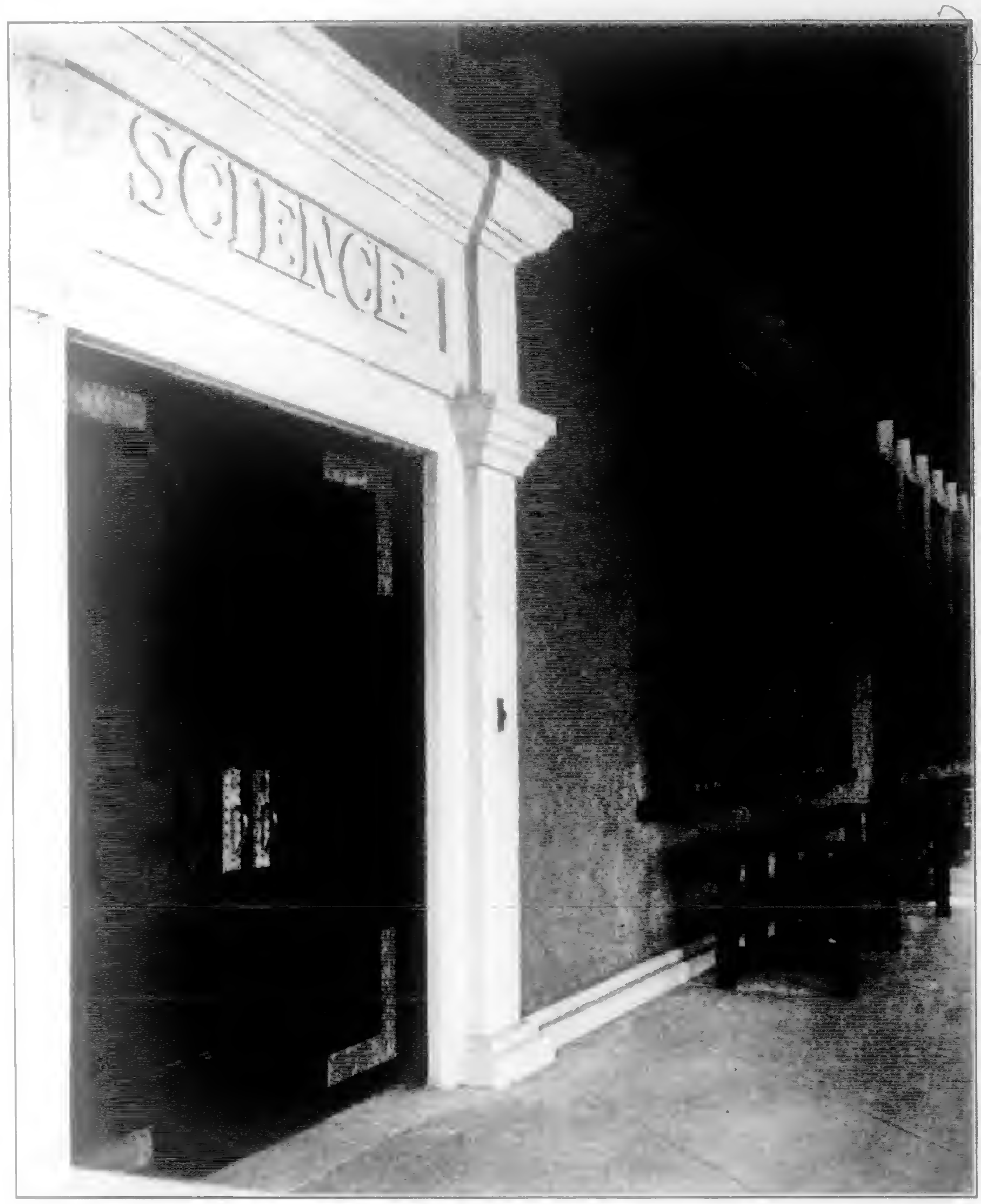
The San Jose High School is perhaps the first high school building constructed on the university plan. It consists of five separate and distinct buildings so grouped and connected as to form one general whole. The administration building, with its massive towers, is the central feature; on either side are the classical and science buildings; at the rear of these are the domestic science and manual arts building. They are all of the same type of architecture with rough cement plaster exteriors and red tile roofs, and are connected by three cloisters. One of these runs through the towers between the east and west entrances and is crossed by the other two which extend from the classical and science buildings to the rear end



High School, San Jose—Plan of First Floor.



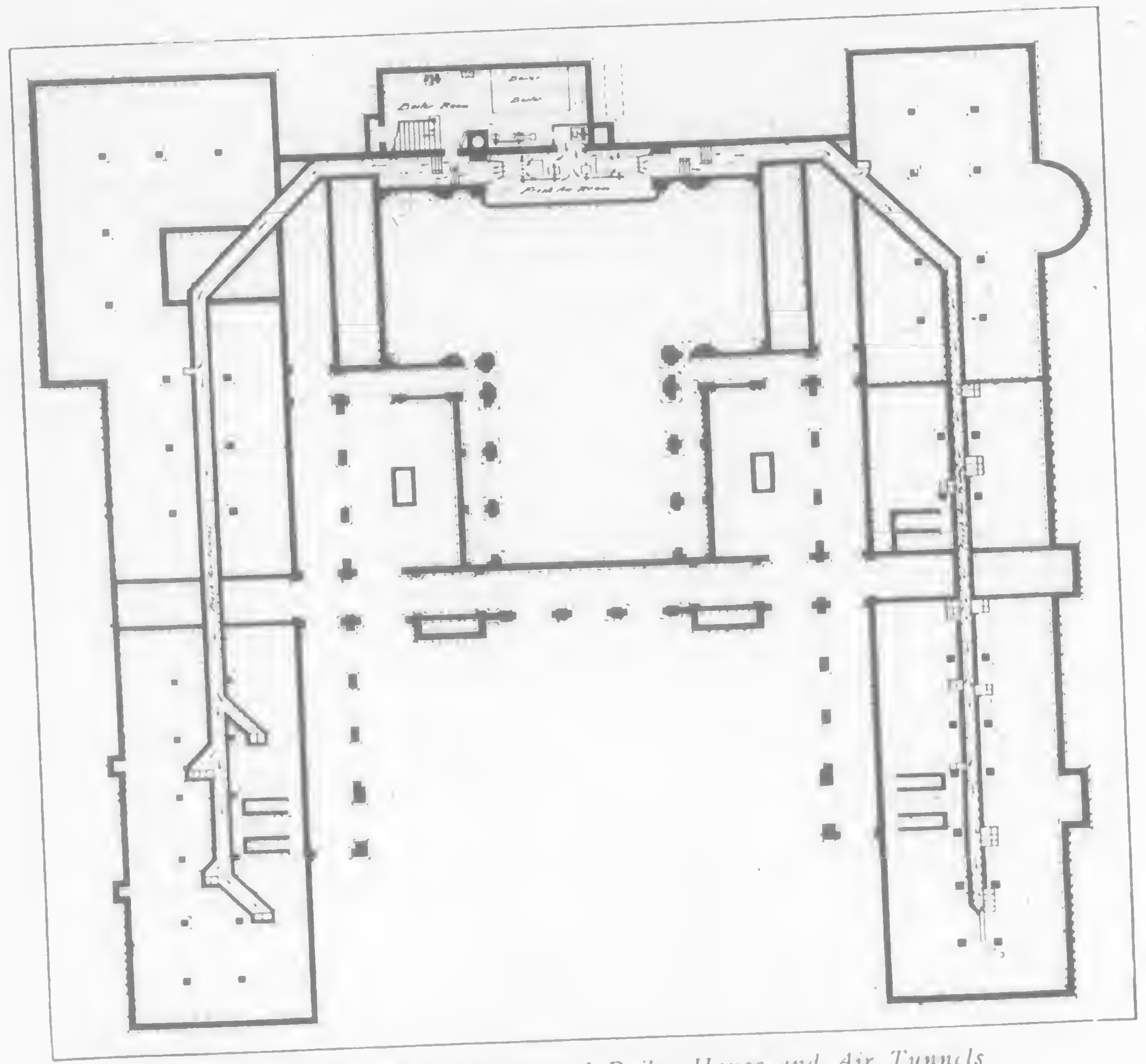
Plan of Second Floor.



High School, San Jose— The Science Building
F. S. Allen, Architect

of the group, each of these two side cloisters leading to the side entrances of the assembly hall in the main building. The east cloister also passes an open court around which are located the various departments of the manual arts building.

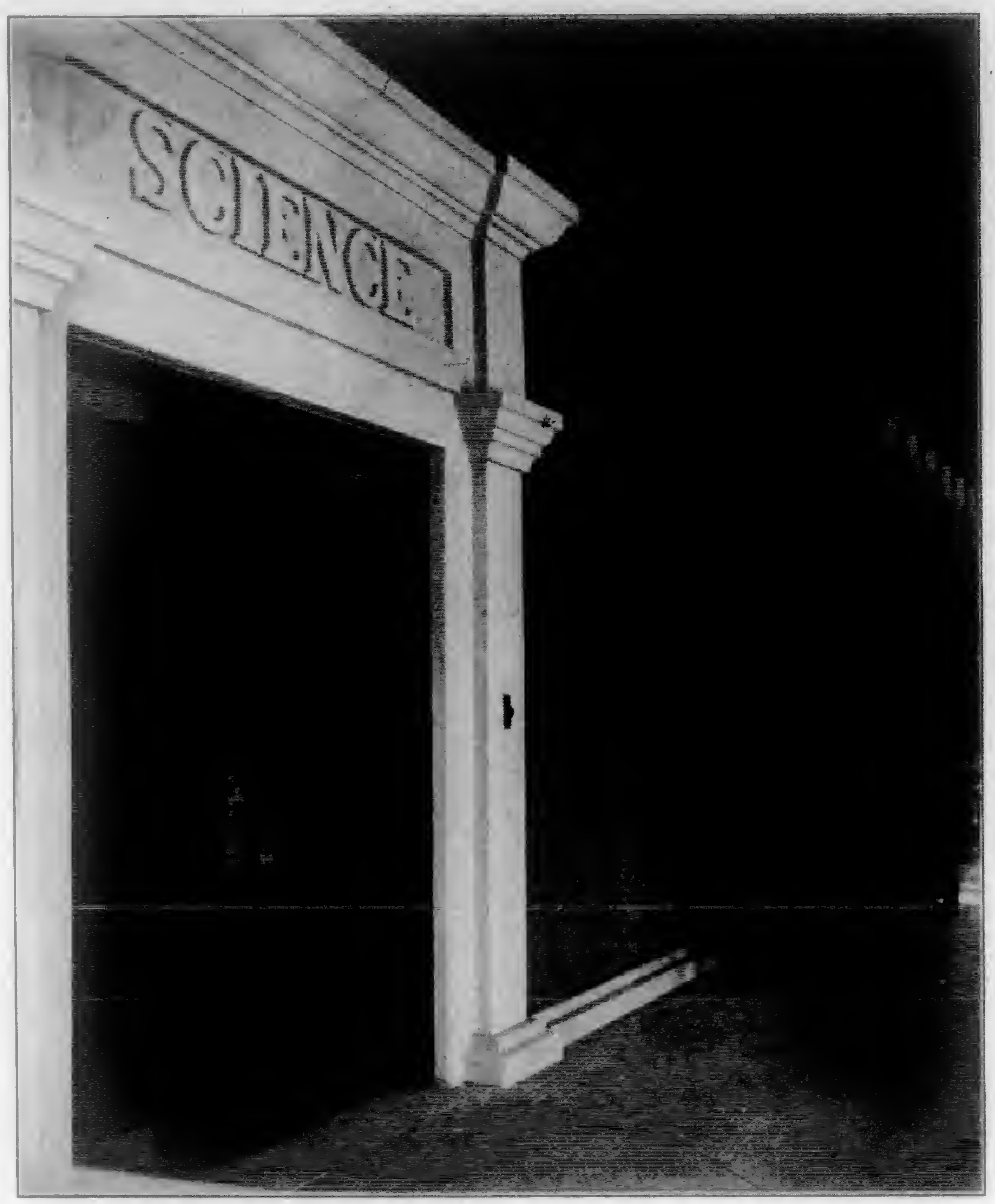
Beyond the front gateway, the reinforced concrete posts of which are replicas of the large towers, is a patio about 150 feet square from the center of which rises a tall cedar flagstaff, with broad concrete walks leading to the front buildings. The three great arches between the towers form an entrance to the main cloister which stretches away to the right and left, nearly 150 feet in either direction.



High School, San Jose—Plan of Boiler House and Air Tunnels



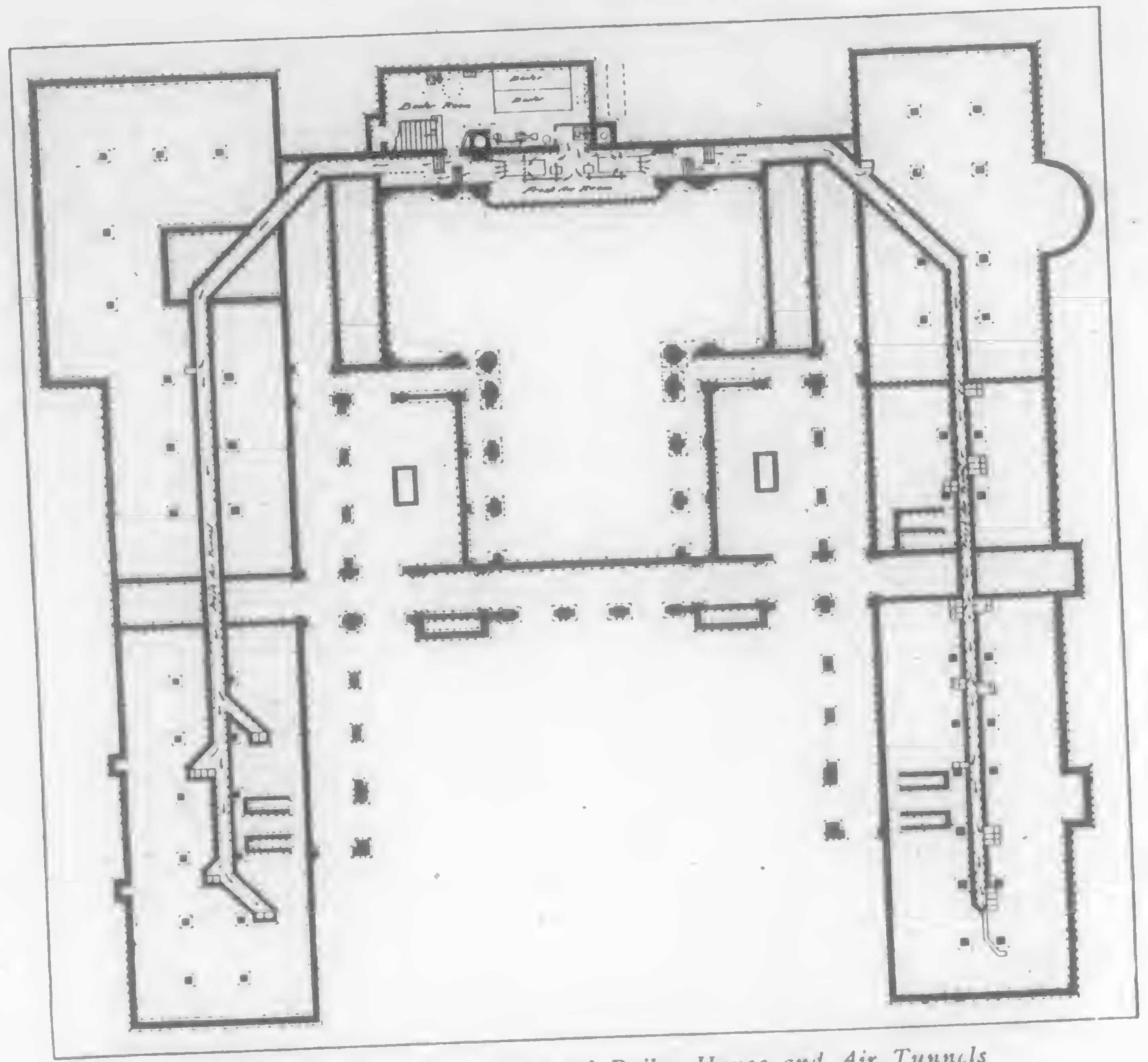
Leading to the Domestic Science Department



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High School, San Jose—Plan of Boiler House and Air Tunnels



Leading to the Domestic Science Department



High School, San Jose—The Front Cloister, Looking East
F. S. Allen, Architect



High School, San Jose—Physical Laboratory



Chemical Laboratory



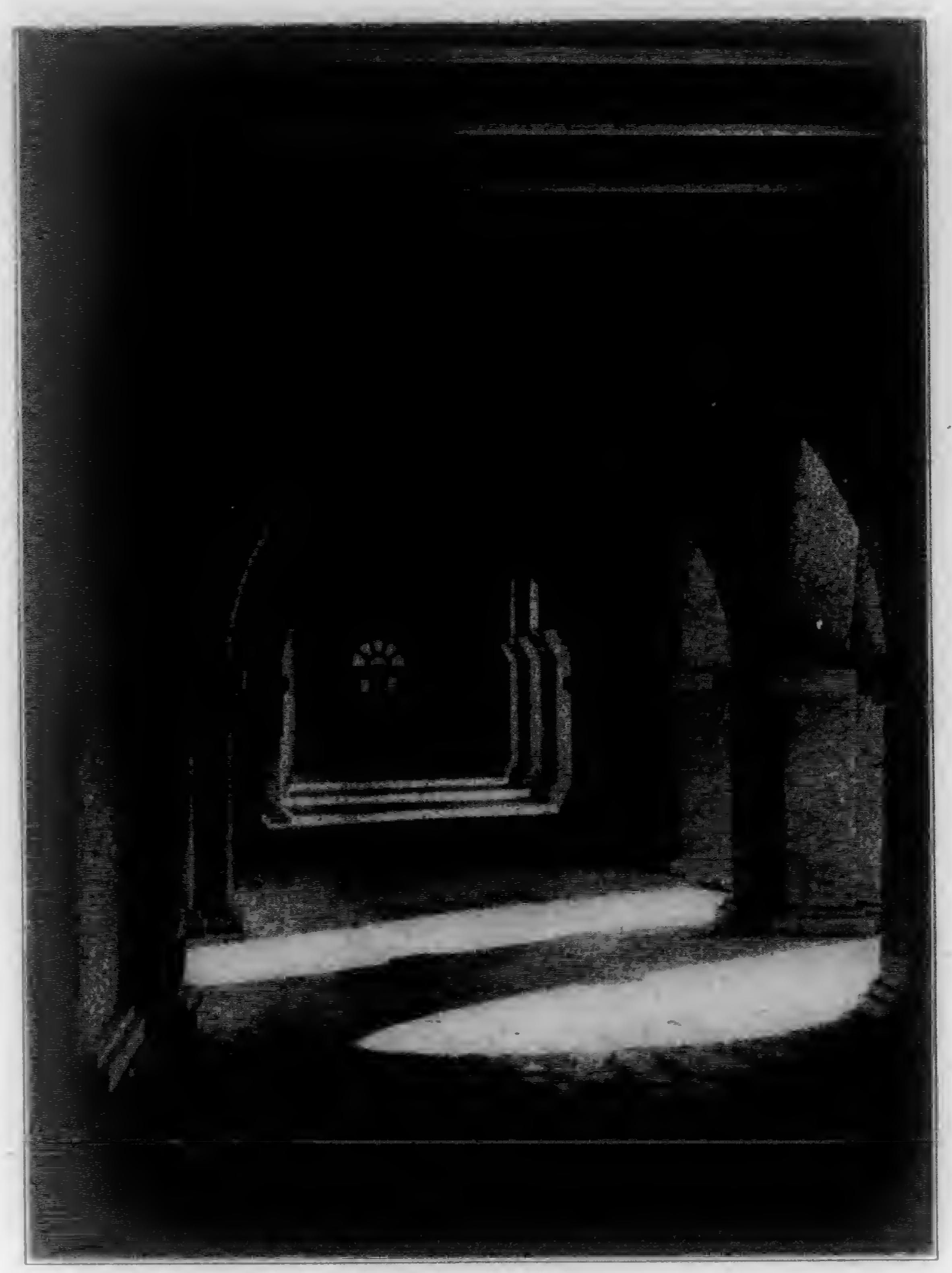
High School, San Jose—The Front Cloister, Looking East
F. S. Allen, Architect



High School, San Jose—Physical Laboratory



Chemical Laboratory



High School, San Jose—Front Cloister, Looking West

From this cloister a stairway ascends to the offices of the department of education in the west tower. The location of these offices is so arranged that they in no way connect with the High school proper.

As will be noticed by a glance at the illustrations, the building is a striking example of the Mission type of architecture. The several buildings will accommodate 1000 pupils. While not fireproof it is of very slow-burning construction. The building cost $200,000 including architect's fees, furniture, etc. The new high schools of New York, Cleveland, Chicago, Baltimore and other Eastern cities have been spending from $500,000 to $550,000 for schools of this size, but of course the Eastern buildings are of fireproof construction and contain more elaborate shop and special equipment.

Z. O. Field of San Jose was the builder. Mr. Field was also the contractor of the new Horace Mann school in the Garden City.

* * *

"Why is Jones growing a beard?"
"Oh! I believe his wife made him a present of some ties."



High School, San Jose—When Two Cloisters Cross

Stick to your Wad of Clay

(After Kipling.)

A brickmaker worked in an honest way,
Molding his wad of clay;
He always was there when the whistle blew,
And never was told what he must do
His life was happy and gay.
He rose from the bottom through the ranks;
To attention to business he gave his thanks.
He laid up a fortune by no ways mean,
And he made it all in a manner clean.
Wherever he went he could pay.
But he grew smart, as many men do;
He wanted to branch out, as I and you.
So in on the ground a promoter permitted;
As president he was especially fitted.
So he was elected one day.
But things go wrong when one's not on to the job;
You can't meet the trade and with them hobnob,
And he soon found the fortune which he had amassed
Far from his grasp had quickly passed.
He's back molding a wad of clay.

—Clayworker.

Should Architects Sign Their Work?

The question of the advisability of architects signing their buildings has been taken up seriously by the American Institute of Architects, and the sentiment of that body is that the designer should exercise his own judgment in the matter of affixing his name-plate to his production. Members of the profession on the Pacific Coast, in reply to queries from this magazine, are almost unanimous in declaring themselves in favor of the practice when the work is of a substantial nature—a truly architectural conception—or a building of public character. One architect expressed fear that if the signing of buildings became general it would extend to factories and private houses, which would, indeed, be ridiculous.

CLINTON DAY, Architect

IN RESPONSE to your question as to whether architects should "sign" their constructed work, I see no reason why such custom should not prevail—not so much for its advertising advantage as to put architecture in the class with painting and sculpture. Of course, the architect's calling differs from that of the artist's in that much of his work has to fit prescribed limitations in design and appropriation, and more than often the completed structure has little attraction for others than its owner or tenant; but when the building, either for public or business uses, has sufficient merit to excite comment, it is a satisfaction to know the name of its author.

Personally, I favor a modest tablet in a sufficiently conspicuous place to tell its story to the curious, the architect to be his own judge as to which samples of his work are worthy of lasting association with his name.

Certainly no fair critic would object to such practice any more than to the signature which we always look for on paintings or statuary.

G. ALBERT LANSBURGH

Member of the firm of Lansburgh & Joseph, Architects, San Francisco

Answering your communication, would state that architects should sign their work and that said work should include all classes of building. Any artist is supposed to sign his productions, and because architecture in general represents, more or less, a combination of assistants, it is no reason why the designer should not put his name on the finished production.

Painters and sculptors had assistance; the work of the masters were not entirely made by them, but pieces here and there were done by their pupils. Nevertheless, the masters, whose ideas and schemes were eventually given forth to the public, signed their names to the work.

It is our opinion that the name of the architect placed upon the building would tend, if anything, to make him more conscientiously study his production, so that he might not be ashamed to acknowledge the authorship. Art would consequently be benefited by such a practice, which is universal in Europe and becoming so in this country even as far west as Los Angeles, where we recently noticed that the Hamburger building was signed by the architect and contractor. This is especially the practice in Paris and in all French cities, and, as we before stated, an almost general rule in Europe.

CHARLES W. BROWN

Member of the firm of Bakewell & Brown, Architects, San Francisco

We can see no reason why an architect should not have his name placed in some inconspicuous place on a building, as is done in France, where the name of the architect is cut in one of the stones of the facade where it would only be seen if looked for. There would probably be an abuse of the privilege, however, and as the name of the architect of any meritorious building is generally known, at least to those who are interested in architecture or in building, we can see no legitimate advantage to be derived from such a display.

It would probably be used as a means of cheap advertising only, and as the situation of the building and the prominence of the name plate would be of more value in an advertisement than the excellence of the building on which it was placed, we think such an arrangement might work actual harm. The principle of modern advertising is the keeping of a name before the public until the time arrives when it wants the article in question; then it thinks, first of all, of the name which has been most familiar. The minute any profession takes up advertising as a means of procuring work, merit must take second place. It may still have a place, but it is not, as it should be, the only thing to be considered.

WILLIS POLK

Member of the firm of D. H. Burnham & Co., San Francisco

Replying to your inquiry, "Should architects sign their work?" I beg to reply that they should, if they want to and the owner does not object.

CLARENCE R. WARD

Member of the firm of Meyers & Ward, Architects, San Francisco

In answer to your inquiry, "Should architects sign their work?" I believe they should be permitted to sign all important Government buildings, and I also think that the owners of important buildings used by the public or of interest to it should be induced to permit the signing of same.

An architect's signature applied indiscriminately to all classes of his work would seem trivial and useless and would savor too much of the advertising practices of a number of our architects who, during the course of construction of same, placard all sorts of buildings and near-buildings with their names and "business" addresses. This partakes of the methods of the "quack" doctor or the "easy" dentist, and cannot be considered either dignified by or useful to the whole people. On the other hand, the signing of the character of completed structures above referred to is a matter of public interest, and at the same time permits the author to permanently affix his name to a worthy work and thus aid in perpetuating his art and his reputation.

G. ALEXANDER WRIGHT

Member of the firm of Wright, Rushford & Cahill, Architects, San Francisco

In reply to your letter of the 16th inst. asking as to whether, in my opinion, architects should sign their buildings, I fail to see that anything is to be gained by their doing so.

The fact that a structure bears an architect's name will make it no better or no worse than it really is. "Good wine needs no bush," and a good building will always speak for itself. But if it should happen that a building is open to criticism, where is the sense in disfiguring it still further?

Because artists and sculptors sign their work, is that any reason why an architect should follow their example, as some makers of concrete sidewalks do?

In the case, however, of a truly architectural conception, honestly constructed, we will say of "national" importance, then I see no objection to the architect's name appearing upon the building in suitable form, if he so desires it; but for other types of buildings I should say "No." This, however, is only my individual opinion, and you have it for what it is worth.

NATHANIEL BLAISDELL, Architect

In reply to yours of recent date I may say that I could not give a favorable answer to the question that you raise—that is, the signing of their work by architects.

My understanding from this is that you wish an opinion on the "rare" custom of architects inscribing their names on a prominent part of a building that may have been erected by them. While I have seen buildings that may be considered worthy of such an autograph, I have seen others that were not.

This custom might even work in the opposite direction and prevent the architect from obtaining any further commissions. But, seriously, I believe a man will be "known by his work," and if it has quality the results will be assured, and without an epitaph.

KENNETH MacDONALD

Member of the firm of MacDonald & Applegarth, Architects, San Francisco

In answer to yours of recent date regarding the advisability of architects signing their work:

Professional etiquette permits of an architect placing on each one of his buildings a carefully designed and modest bronze plate, or plate of other acceptable material. If each architect knows that the people will find out who designed the building, he will try to make it a creditable one to himself.

WILLIAM H. TOEPKE

Member of the firm of Havens & Toepke, Architects, San Francisco

In reply to your inquiry with reference to architects signing their work, would say that when there is no objection raised by the owner, and the building is of sufficient size and importance to warrant it, we think that the name of the architect should be placed on the building, giving the architect the credit of the work, the name to be of small size, so as not to be too conspicuous.

LOUIS CHRISTIAN MULLGARDT, Architect

I believe that a modest, consistent signing of any architectural production would have a salutary effect, both as regards the public and the profession.

T. PATERSON ROSS, Architect

Member of the firm of Ross & Burgren, San Francisco

It seems a perfectly reasonable contention that architects should sign their work. Every piece of sculpture, every painting, every seal or medal, or other work of art shows clearly on its face the name of the artist in whose brain it originated, and whose dexterous hand gave it its form and color. Had this been customary with our buildings centuries ago, our knowledge in architectural history would have been positively greater and at the same time devoid of idle or misleading suppositions concerning authorship. Surely architectural work ennobles the author, and the author ennobles his work. An architect needs to receive inspiration, and also to put inspiration into his work. I know therefore of no reason why an architect should not sign his work.

The Law Regulating the Practice of Architecture in California

By ROBERT MORGENEIER, Architect and Engineer

Architect Robert Morgeneier of Oakland contributes the first of a series of articles on "The Law Regulating the Practice of Architecture," in this number of the Architect and Engineer. The article will undoubtedly interest every member of the profession, for it calls attention to many weak points in the law and suggests remedies which seem entirely practicable. The proposition to draft a city ordinance requiring the sealing of all drawings submitted with applications for building permits, is timely and should result in concerted action. The plan has been successfully carried out in Illinois, and what can be done elsewhere can certainly be accomplished in California.

IN SEVERAL of the states the practice of the profession of Architecture is now regulated and protected by statutes. The statutes of Illinois, 1897-1899, and those of California, 1901, are typical of this class of legislation. Their essence consists in the declarations of who shall use the title "Architect," and the conditions under which such title may be acquired and employed. The ultimate aim of these laws is to safeguard the public by putting the designing and structural supervision of buildings into competent hands.

To vitalize themselves, and become effective, the statutes provide for the formation of Examining Boards, and delegates to these the power to formulate and put into effect rules and regulations under which candidates for the title of architect shall be examined, such titles to be either refused or allowed, cancel titles, prevent the unlawful use of the title, and collect fees.

The laws may well be considered an outgrowth of the specializing tendency of the period—a tendency fruitful of valuable results and phenomenal expansion in America during the last decade.

In the older countries specialization has also obtained a foothold, but its progress is slower. Thus, in the year 1901, and date of the California law, continental European practice considers, and to this day considers, the architect and builder as one, adhering to the Greek definition of the term architect, viz., "chief builder."

With us, specialization has brought the conception of architect up to the eminence of "chief creator," or one whose intellectual gifts enable him to create in the abstract a complete, safe, useful and, if called for, beautiful, structure which, reduced to paper, he can turn over to others for reproduction in the solid materials.

The germ of the law of 1901 is this view, and it recognizes that every interest of the public calls for a control or regulation of those who would assume this eminent title, for the simple reason that if entrusted to the incompetent, great injury will result.

Let us now consider the actual conditions which lead to the conception and promulgation of the present laws.

The phenomenal growth of our larger cities, the activity of promoters and contractors, devoid of any principles technical or otherwise, had become an actual menace to the public security, which, if left unchecked, would of necessity lead to the most deplorable results. The best talent in the profession of architecture viewed this with alarm, and finally appealing to the legislative bodies of their states, secured the passage of the laws.

A fortunate factor, and one which greatly facilitated the enactment of these laws, was the fact that from the earliest times the American architect and the American contractor or builder have been considered as widely separated and distinctive classes. To the architects have been accorded the position of a learned profession, and it was not supposed that he was to maintain himself by undertakings outside of his particular profession. This well-grounded segregation facilitated the enactment of protective and directive laws as a natural sequence.

Referring to the act of Illinois, 1897-1899, Sec. 9, typical of the California act of 1901, it is set forth that "any person who shall be engaged in the planning or supervision of the erection, enlargement or alteration of buildings for others, and to be constructed by other persons than himself, shall be regarded as an architect within the provisions of this act."

Under this provision only those are to be considered as architects who prepare plans and superintend constructions erected by others, not erected by the architect himself. Therefore he is not to be architect and contractor or builder at the same time. From this it is readily deducted that notwithstanding a contractor or builder may prepare his own plans, he is not entitled to the appellation "architect."

As a consequence, anyone prefering to engage in building after his own plans can continue doing so, but not under the law title of "architect." From this viewpoint it would appear as if the purpose of the law was defeated, incompetent parties, without title or law, being allowed to erect buildings which may prove a menace to the safety and welfare of the public. But at this juncture the municipal law of cities, notably Chicago, steps in and saving the situation provides (Revised Ordinances, 1908) that building permits shall be issued only upon the presentation of complete general arrangement plans bearing the seal of a duly certificated architect.

Thus the statute applicable generally is locally operative by ordinance, and such ordinance places the entire liability for the safety, at least, of the proposed structure upon one holding authority from the State, and should a later detailed examination on the part of the Board of Public Works or its agents disclose a construction not complying with the building laws, sanitary and other ordinances, the architect affixing his seal to such defective plans can be readily held accountable for his mistake, incompetence, inadvertence or neglect.

The seal is prima facie evidence that the plans are proper ones, and this relieves the Board of Works of any exhaustive examinations until actual operations are undertaken. At the same time a fully qualified architect can readily pass on plans submitted to him, and his charges for such examination and subsequent attest by seal will be very moderate.

Up to the present time, the cities of San Francisco, Oakland, Los Angeles, etc., in the State of California, have not adopted the Chicago ordinance. As a consequence they have no protection from defective or dangerous buildings proposed to be erected, excepting the protection provided by their respective building ordinances, and the fidelity of their inspectors. The extra protection provided under the statutes should be seized upon at once, to the end that capital, the upbuilding force of cities, may have the same assurances as are offered by the Eastern cities.

It is of interest to note the progressive operation of the California law. The successful applicant for a certificate pays an initial fee of $25, is entered upon the list of licensed architects, and receives his certificate of recommendation from the examining board directed to the Secretary of State, who thereupon issues a diploma, exacting a fee of $5. Thereupon and following each year the practitioner pays annually to the board of examiners a license fee of $5. This may be considered as an extortion, as the board gives no return value whatsoever. Further, in every county of the state, outside of the residential county of the practitioner, in which a building may be erected from his plans, he must have his certificate registered for each separate case, and pay a fee of $5—a second extortion. Finally, he must pay an annual city license fee for practicing architecture, amounting to $20. This is on a par with poll and dog taxes—evidences of a crude or primitive tax system.

The state tax crudities arise because the act makes no provision for the payment of any of the mileage or per diem expenses, office rent, stationery, etc. of the examining boards, not to speak of the value of their time for which they receive no compensation.

The California board, divided into "Southern" and "Northern" sections, has in addition to the exaction of fees, provided a course of examination which exceeds the limits aimed at by the law, which concerns itself only with the question of public safety in the matter of the structure itself, its sanitary features, etc., and I hold that the board is not empowered to demand artistic proficiency of an applicant. If his presentation of a palace looks like a hencoop he should have 100 per cent credit for it, for some clients want their buildings to look like hencoops. Furthermore, there is no standard of artistic excellence; "The beautiful is difficult" is all we do know. The board's method of examination is also highly defective. The questions are at times involved so that the applicant is at a loss to know if the answer should be academical or practical. The applicants are secluded during examination, so that their answers are simply feats of memory.

If properly conducted the examination should take place in a fully equipped architect's office, with textbooks and data of every kind to hand—this for the reason that if the applicant knows where to look for his information, and knows how to apply it, has demonstrated his ability to combine it, in the form called for by his examiners, he has established his competence. The applicant's efficiency as a draftsman should not be considered except that he show everything in the right place and perfectly proportioned.

The problems as to who was primarily entitled to the right of practicing under a certificate has been properly solved by allowing certificates to those actually practicing as architects only before the law was enacted, and requiring examinations of those coming later.

As to the enforcement of the law, this has been feeble and ineffective, for the reason that no catastrophe has yet resulted from the doings of the inefficient, and, secondly, because the transgressions are few and inconsequential.

* * *

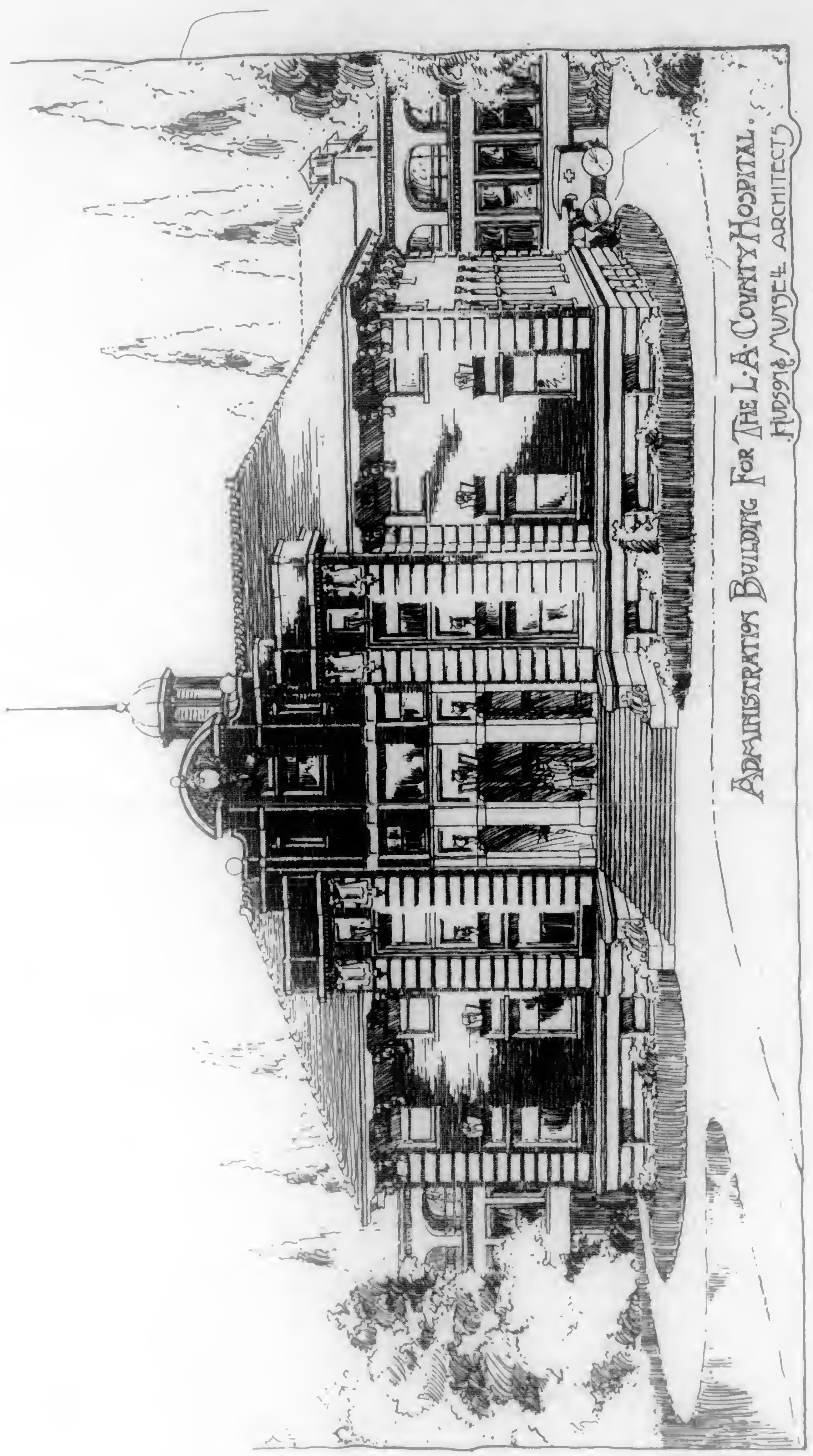
We're coming to it

"Oi hear they do be sindin' missages now widout woires er poles. Faith, it's wondherful toimes we're livin' in, Dinnis!"

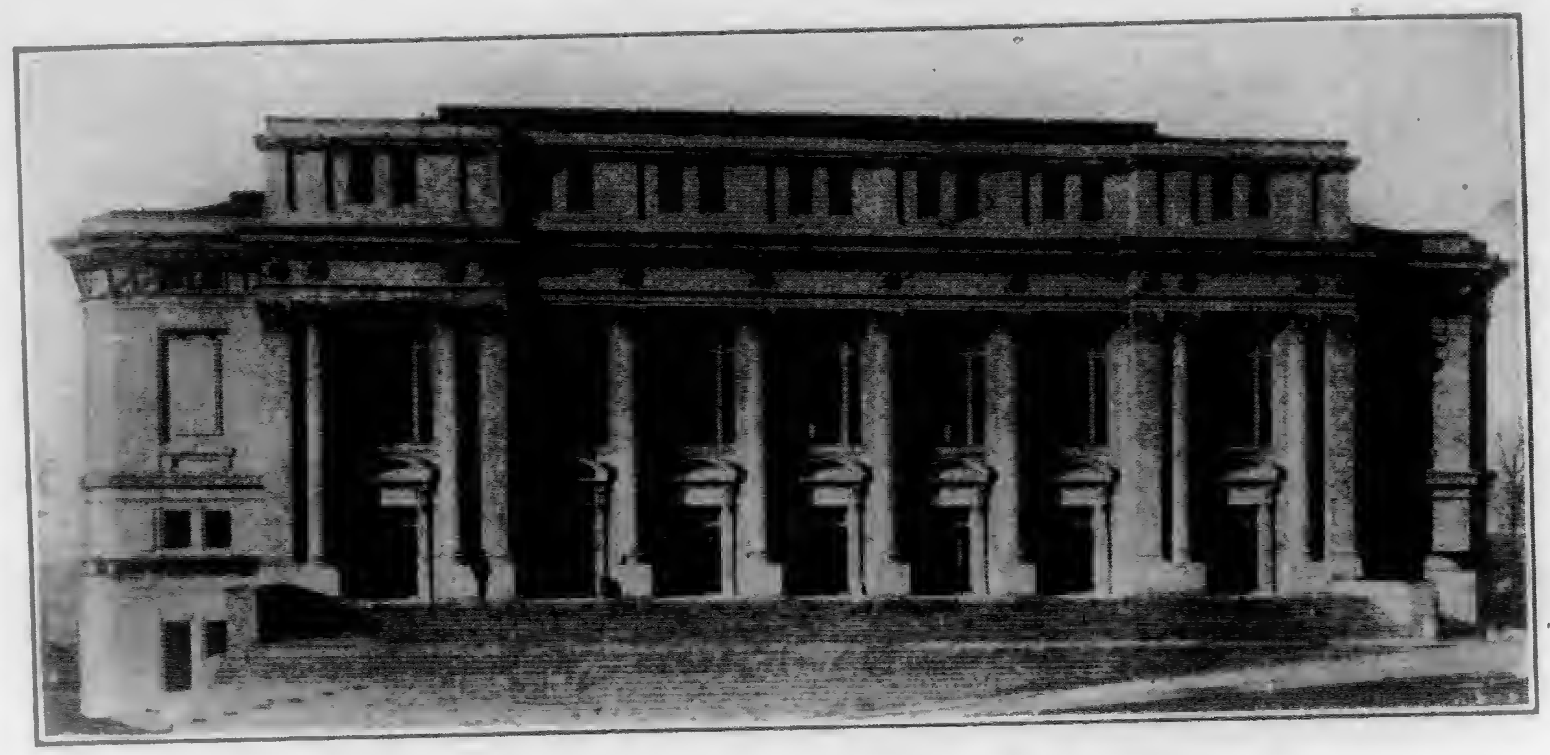
"It is, Moike. Shure, th' way things is goin' we'll be able t' thravel widout lavin' home, wan av thim days."—Judge.

* * *

Half the world struggles to straighten out what the other half does wrong.



Administration Building, Los Angeles County Hospital, Los Angeles, Cal.
Hudson & Munsell, Architects



Auditorium, Alaska-Yukon-Pacific Exposition, Seattle, Wash.
John Galen Howard, Architect

Architectural Features of the Alaska-Yukon-Pacific Exposition Buildings

By WELFORD BEATON

IN THE general plan of architecture the Alaska-Yukon-Pacific Exposition follows the French renaissance style. This applies to the manufactures, agricultures, mines, fisheries and other structures forming the central picture of the exhibition. The buildings are grouped about the Cascades and geyser basin, the main decorative features, and the United States government buildings complete the scheme. The federal structures are a pleasing combination of French and Spanish renaissance styles and the great dome on the main government building is the architectural climax of the fair.

The California state building is of Spanish Mission architecture and the Oregon building is strictly Roman classic in style. This structure is topped by a huge dome and commands prominence in the sky line. The Washington building is two stories in height and in design is a free American treatment of the classic French style of architecture. Seven buildings on the exposition grounds will revert to the University of Washington at the close of the exposition.

These are the auditorium, fine arts, machinery, Washington, Arctic Brotherhood, forestry and women's buildings. The auditorium is Roman classic in design and the fine arts follows the French style of architecture. The machinery hall to be the permanent engineering building for the university, is a modern adaption of the Spanish mission architecture and is an attractive structure.

The agricultures and manufactures buildings are similar with just enough difference of detail to avoid mechanical repetition. On the agricultures building is a beautiful circular pergola colonnade with Ionic columns supporting trellis beams and flower tubs. During the life of the exposition these columns will be covered with woodbine and clematis. The end facades of the building consist of a semi-circular arch fifty feet wide crowned with a pediment containing the official seal of the exposition beautifully worked out in staff. The fisheries building stands on the same side of the Cascades as the agricultures building and Ionic columns were

used to harmonize with the adjoining building. On the opposite side of this court of honor stand the manufactures and mines buildings where Doric columns have been used for the sake of harmony with the adjacent structures.

The forestry building will be the largest log house ever built and about the front of the structure will be 124 logs each forty feet high and containing 6,000 feet in board measure. The weight of each one of these great logs is estimated at 50,000 pounds. The logs used in the exterior of the building are being left in the rough while those used in the interior will have the bark removed.

One of the ornate buildings on the exposition grounds is the music pavilion. This building is of colonial architecture with many of the characteristics of the French style, carrying columns modeled after those surrounding Washington's old home at Mt. Vernon. In the frieze about this building is a musical staff and other decorations of a similar nature.

The home of the Arctic Brotherhood on the exposition grounds is typical of the houses in Alaska and the north of Finland and is built of logs. The landscape features about this building represent gardens seen in the north. The structures to be occupied by the Japanese and Chinese will be strictly Oriental in general character. On the Pay Streak, the exposition amusement street, many of the structures will follow Japanese architecture and the entrance to the gayety boulevard is of Jap-Alaskan design, so called because the main arch will consist of totem poles supporting curved pagoda roofs.

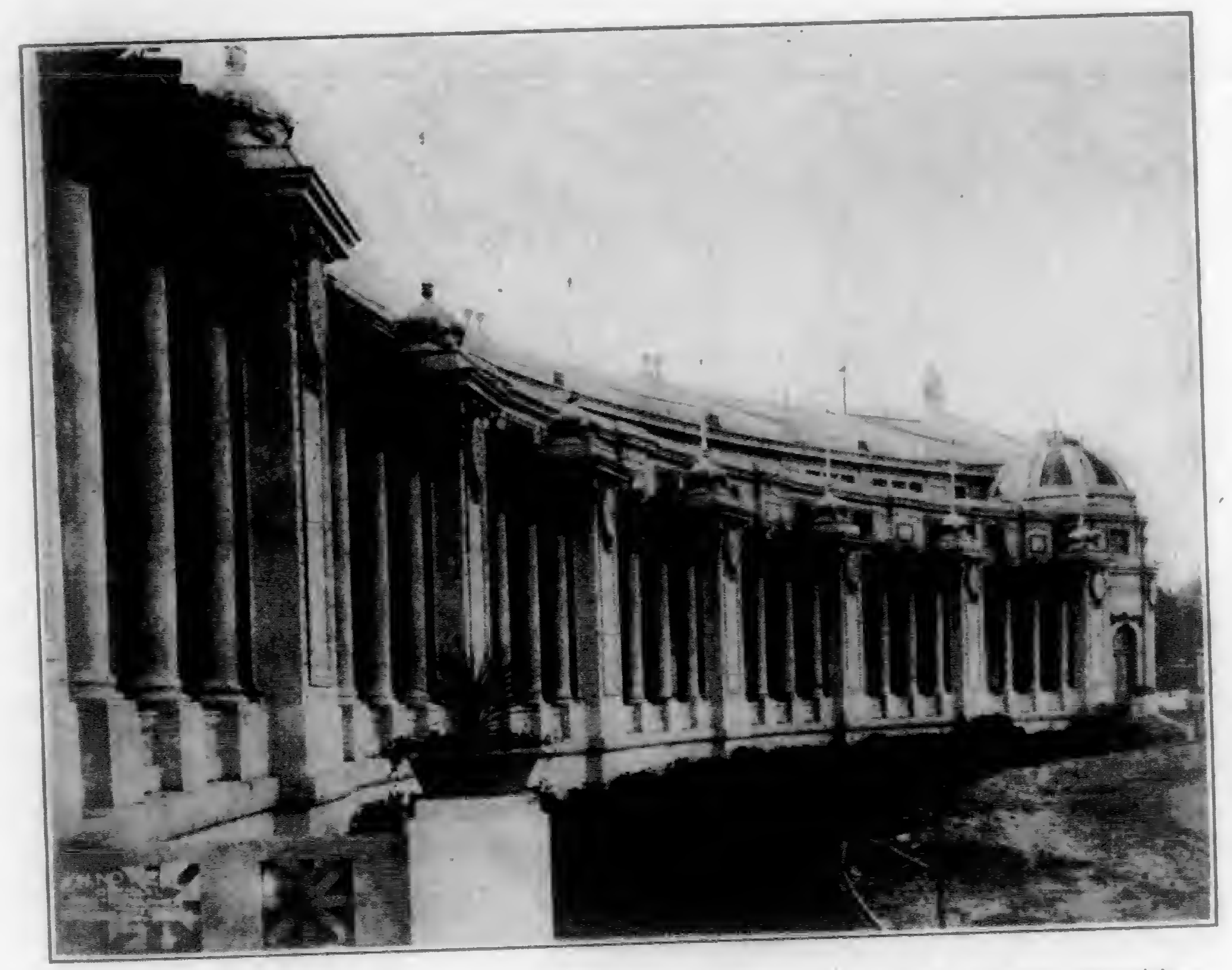
A large number of structures are of the free American style of architecture, but have been so located as to make a complete picture with the buildings in the main group following the French renaissance design.

Surrounding the exposition is a forest and much of the natural verdure has been left. The formal gardens approaching the manufactures and agricultures palaces are similar to those in the public park of Versailles and are French in design. From the standpoint of the lover of the beautiful the Pacific exposition will excel any world's fair in history. The first consideration has been the landscaping, floral display, illumination and sculpture. This combined with the mild climate of the Puget Sound country, the beautiful mountain, lake and woodland scenery and the central location of the grounds will result in the Alaska-Yukon-Pacific exposition being one of the most beautiful and attractive ever planned.

The principal work of sculpture is the exposition monument, at the head of the Cascades. It is seventy feet in height and stands on a pedestal twenty feet high. About the base of the pedestal are three seated female figures symbolical of the Northland, the South Seas and the Orient. The column is of Corinthian design and carries a globe showing the signs of the zodiac. Surmounting this globe is a huge American eagle. The animal groups about the geyser basin are an elk, bear, timber wolf and cougar, all representative of the Northland. Ornamental vases, carrying the official emblem of the exposition in staff, circle the entire central court around the Cascades and the geyser basin and in front of several of the larger buildings. These vases will contain many varieties of flowers and the pergolas about the front of the buildings will be completely covered with climbing roses. The electroliers on the grounds are of French renaissance design and the settees of Roman design. The decorative light standards provide for a large sphere of light each containing sixty thirty-candle power lights.



Manufacturers' Building, Alaska-Yukon-Pacific Exposition, Seattle, Wash.
Graham & Myers, Architects



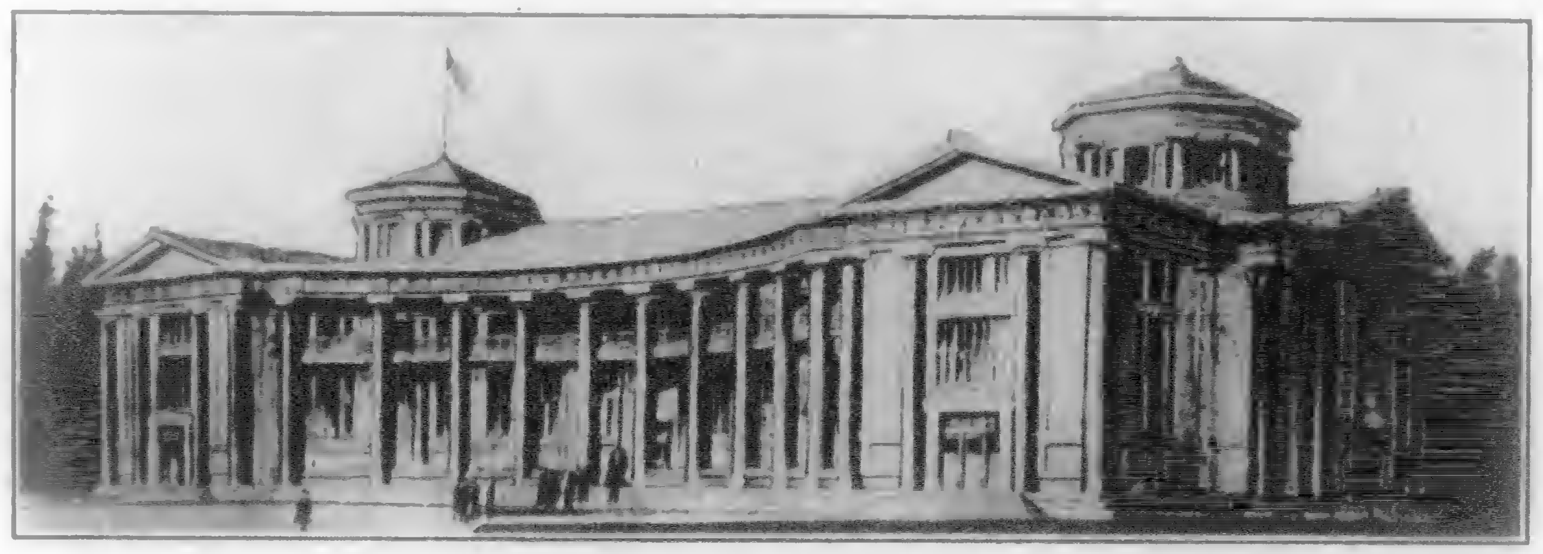
A Series of Pergolas from which Flowering Vines Will Hang. Alaska-Yukon-Pacific Exposition



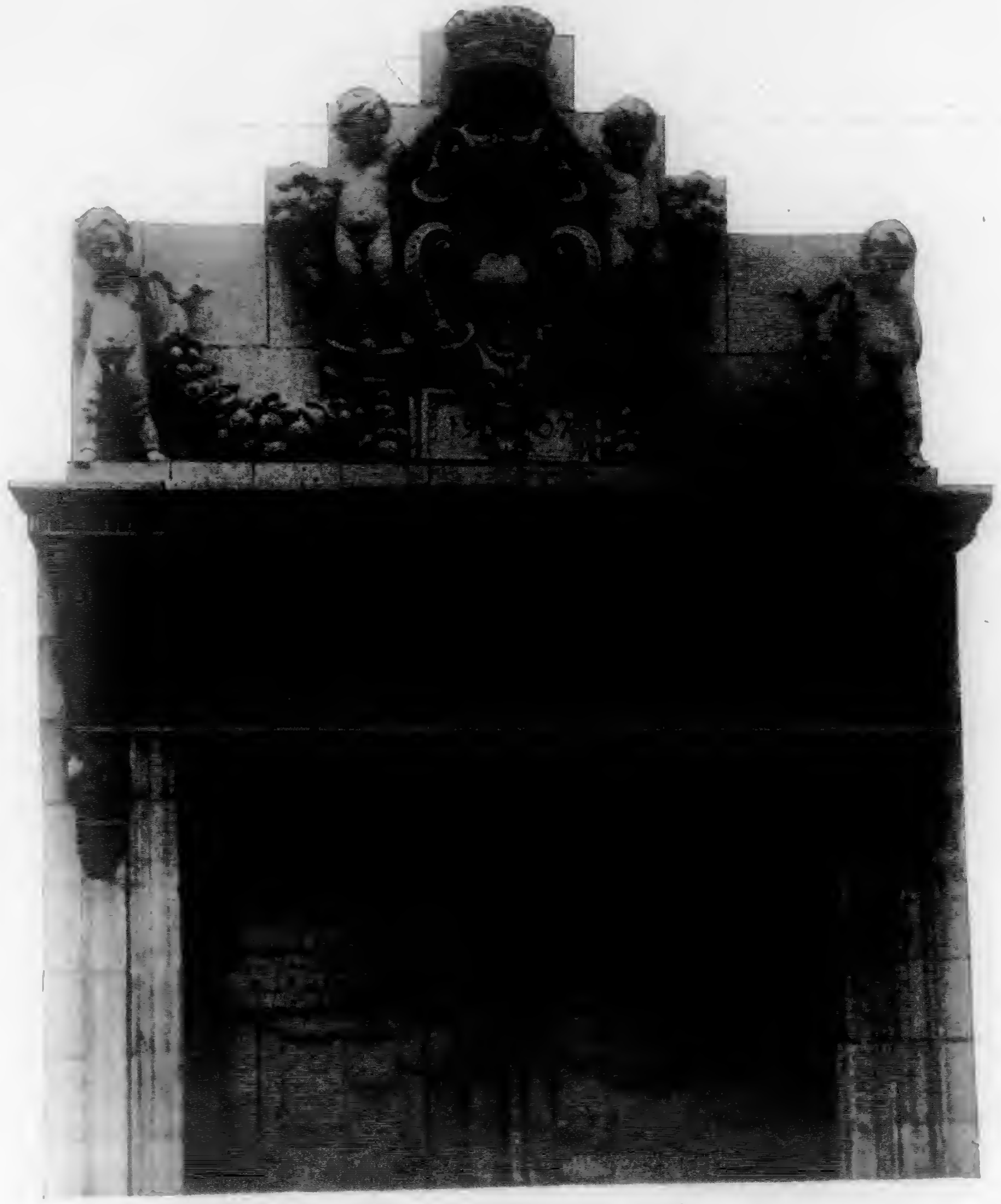
Agricultural Hall, Alaska-Yukon-Pacific Exposition, Seattle, Wash.
Graham & Myers, Architects

The 1909 exhibition will be well lighted and thousands of lights will be used in the illumination of the buildings. On the manufactures and agricultures building will be a total of 17,000 lights for the exterior decorations and it requires more than 5,000 each to outline the mines and fisheries buildings. On the fine arts building will be 4,000 globes and the auditorium will require 5,000 lights. In the geyser basin are more than 1,000 lights and 1,500 will be used in the electrical decorations under water about the Cascades, illuminating the falls with colors of the rainbow.

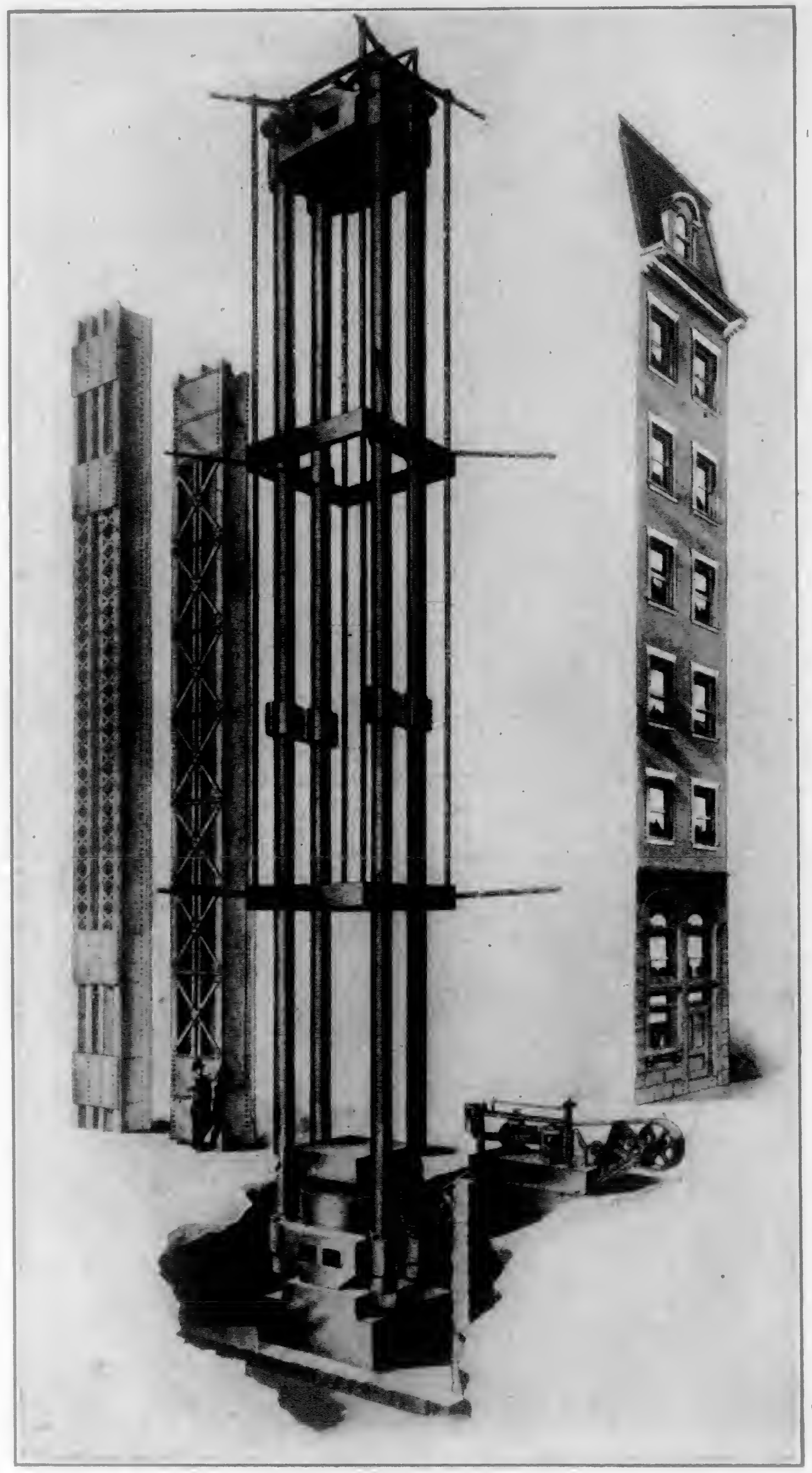
In the green houses owned by the exposition company are more than 1,000,000 plants of every description to be used in building beautiful floral designs and sunken gardens. When the exposition opens, climbing roses, geraniums, rhododendrons, cactus dahlias and many other varieties of flowers will be found massed in profusion about the big structures giving forth color and perfume from every conceivable nook and corner. The building of the exposition has progressed to such an extent that the fair will be easily ready one month before the opening date June 1, 1909.



Forestry Building, Alaska-Yukon-Pacific Exposition, Seattle, Wash.
Saunders & Lawton, Architects



Pediment over Entrance to Station C, San Francisco Gas and Electric Company
D. H. Burnham & Co., Architects



Hydraulic Compression Testing Machine Being Built for the United States Geological Survey

A Ten Million Pound Hydraulic Compression Testing Machine

By RICHARD L. HUMPHREY, C. E.

THERE is being constructed for the Structural Materials Testing Laboratories, United States Geological Survey, a vertical compression testing machine of ten million pounds capacity. This machine, having a gross weight of over 200 tons and an extreme height above foundation of about 80 feet, is the largest ever constructed.

The machine was primarily acquired for the purpose of testing large blocks of stone made necessary by the study of the building stone of the country, as requested by the Supervising Architect. Inasmuch as it was deemed desirable to study the effect of flaws and defects of the various kinds in large blocks of natural stone, a machine of this capacity was determined upon. In order to care for a further request of the Supervising Architect, for data relative to the strength of structural columns of brick and concrete, as well as of structural steel, the original clearance between heads was increased from 25 to 65 feet. Already the need for this machine in the investigation of built-up structures is established through the urgent requests for its early completion.

Some idea of its size may be obtained from the accompanying illustration in which has been sketched one of the chords of the Quebec bridge which collapsed, and also a larger chord which was used in the Blackwell's Island bridge. It is readily apparent that this machine is capable of testing built-up structures of even greater size than those referred to.

The following brief description has been prepared because of the interest which has been manifested, and in response to the frequent requests which have been made for information concerning the machine.

The machine is a large hydraulic press, with one adjustable head, and a weighing system for recording the loads developed in it by means of the triple plunger pump. It has a maximum clearance between heads of sixty-five (65) feet; the clearance between the screws is a trifle over six (6) feet, and the heads are six (6) feet square.

The machine consists of a base containing the main cylinder with a sectional area of 2,000 square inches, upon which rests the lower platform or head which is provided with a ball and socket bearing. The upper head is adjustable over four vertical screws (13½ inches in diameter and 72 feet, 2 inches long), by means of gearing operating four nuts with ball bearings upon which the head rests. The shafting operating this mechanism is connected with a variable speed motor which operates the triple plunger pump which supplies the pressure to the main cylinder.

The weighing device consists of a set of standard "Olsen" levers upon which is weighed 1/80 of the total load on the main cylinder. This reduction is affected through the medium of a piston and diaphragm. The main cylinder has a diameter of 50 inches, and the smaller a diameter of 5 9/16 inches. The weighing beam, is balanced by an automatically operated poise weight and is provided with a device for applying successive counterweights on one million pounds each. Each division on the dial is equivalent to 100 pound loads; the smaller sub-divisions are possible by means of an additional beam.

* Published by permission of the Director of the U. S. G. S.

The power is applied by means of a 15 H. P., 220 volt variable speed motor operating a triple plunger pump. The gearing operating the upper head is driven by the same motor.

The extreme length of the main screws necessitates splicing, which is accomplished as follows:

In the center of the screws at the splice is a three-inch threaded pin for the purpose of centering the upper and lower screws; this splice is strengthened by means of split sleeve nuts, which facilitates the removal of the sleeve nuts whenever it is necessary to lower the upper head; after the head has passed the splice the sleeve nuts are replaced.

In order to maintain a constant load a needle valve has been provided which will allow, when the pump is operated at its lowest speed, a sufficient quantity of the oil to flow into the main cylinder to equalize whatever leakage there may be. The main cylinder has a vertical movement of 24 inches.

The speed of the machine for purpose of adjustment, using the gearing attached to the upper head, is 10 inches per minute. The speed for applying loads, controlled by the variable speed motor driving the pump, varies from the minimum of at least 1/60 of an inch per minute, to a maximum of at least ½ inch per minute.

The contract provides that the machine shall have an accuracy of at least one-third of 1%, for any load over 100,000 pounds up to the capacity of the machine.

Some idea of the size of the machine may be obtained from a statement of the weight of its principal parts. The castings for the base and the top head weigh approximately 50,000 pounds each. Each main screw will weigh over 40,000 pounds. The lower platform weighing about 25,000 pounds, and the main cylinder 16,000 pounds. The top of the machine will be about 70 feet above the top of the floor, and the concrete foundation upon which the machine rests will be about 8 feet below the floor line.

* * *

Employment Statement of An "Open Shop"

HERE is a copy of an application blank which F. O. Engstrum, the well known "open shop" contractor, requires to be filled out before he will give a man a job. It is needless to say that if the applicant admits affiliation with any union he gets nothing from Mr. Engstrum:

1. Full name ....
2. Address—Street No. ....City ....
   County .... Phone No.........
3. How long have you resided at the above address? ....
4. Nationality ....
5. Give names of persons for whom you last worked, kind of work, and length of time of employment ....
6. Are you a member of a Union? ....
7. If a member of a Union, give name of local Union, and office you hold, if any ....
8. If not a member of a Union, were you ever a member? ....
9. If so, what Union? ....
10. When did you cease being a member? ....
11. Why did you cease being a member? ....
12. Are you willing to work for and use your best ability and all honorable means to protect F. O. Engstrum Co.? ....

Signed.......................................



Union Street, Seattle, Paved with Vitrified Brick in 1903. Photo taken in 1908

Vitrified Brick as a Paving Material

THAT vitrified brick is now in the lead as a paving material throughout the United States is fully proven by an exhaustive article on the subject of street pavements in a recent issue of the Municipal Journal and Engineer of New York. To ascertain the true status of affairs in the matter of materials for streets and roadways, the Journal and Engineer sent to the city engineers of all cities of 8000 population or over, and to a majority of those between 4000 and 8000 which were believed to have city engineers, blanks asking for information concerning street paving and part of the information collected by this means is shown herewith. The data obtained covers all styles of paving in use at the present time in the United States, and the compilation is very exhaustive in its scope. In sending out the blanks calling for statistics, the United States was divided into groups of states, "whose conditions and problems with reference to paving were similar."

PAVEMENTS IN SERVICE—SQUARE YARDS

DISTRICTS	Number Cities	BRICK	ASPHALT	Wood Block	BITULITHIC
New England	47	361,777	215,021	49,008	277,859
Middle Atlantic	82	6,631,280	9,162,037	17,923	245,728
South Atlantic	27	1,538,061	246,142	42,209	272,160
Ohio Valley	113	19,257,527	1,945,097	230,488	432,352
Upper Mississippi and Missouri	115	9,156,065	5,906,642	1,101,705	159,387
Lower Mississippi and Gulf	20	418,020	198,006	....	260,000
Rocky Mountains	20	13,693	282,984	31,200	30,452
Pacific Coast	10	30,255	1,050,119	....	201,563
Total square yards		37,406,678	19,006,048	1,472,533	1,879,501
Per cent. of all		62.58%	31.80%	02.48%	03.14%
Per cent. brick over asphalt		66.00%	34.00%	....	....
Per cent. brick over wood block		96.00%	....	04.00%	....
Per cent. brick over Bitulithic		95.00%	....	....	05.00%

By the above it will be seen that 434 cities in the eight sections of the United States made replies, and they speak for themselves as to the popu-



Pike Street, Seattle, Paved with Vitrified Brick in 1893. Photo taken in 1908



First Avenue, Seattle. Paved with Vitrified Brick in 1893. Photo taken in 1908



Second Avenue, Seattle. Paved with Vitrified Brick in 1895. Photo taken in 1908

larity of vitrified brick. A noticeable feature in the compilations embodied in the divisions of work contracted for, work decided upon and work contemplated, is the great increase in brick pavements throughout the country, save on the Pacific Coast.

To make this clear and to get at exact facts, one needs but to eliminate the figures covering brick and asphalt for Pacific Coast cities, when results for the rest of the United States show up as follows:

For "work contracted for," brick has 70%, asphalt 30%. For "work decided upon, but not yet contracted," brick has 82.3%, asphalt 17.7%. For "work contemplated, but not yet definitely decided upon," brick has 88.54%, asphalt 11.46%.

While it is true that vitrified brick suitable for street paving purposes have been manufactured in the Pacific Northwest for 17 years, yet only within the past two years have vitrified brick been manufactured on the Coast in large quantities.

* * *

Concrete Buildings and Earthquakes

THE following article which appeared in the "Edinburgh Weekly Scotsman" shows conclusively the efficiency of reinforced concrete in earthquake zones.

"The earthquake has given an object lesson in the art of building in these zones of danger, which might serve for the rebuilding of the ruined cities. Two houses, the only ones in Calabria, (Italy) made of reinforced cement, not only did not fall, but seem not even to have felt a jar, as the plaster and plinth, and even the books, ornaments and pictures and so on, were intact, the only damage being debris from other houses. The inmates naturally were untouched. The proposal has been made to build the new cities entirely of this material, which, although costly, will at least prevent another disaster of like magnitude."



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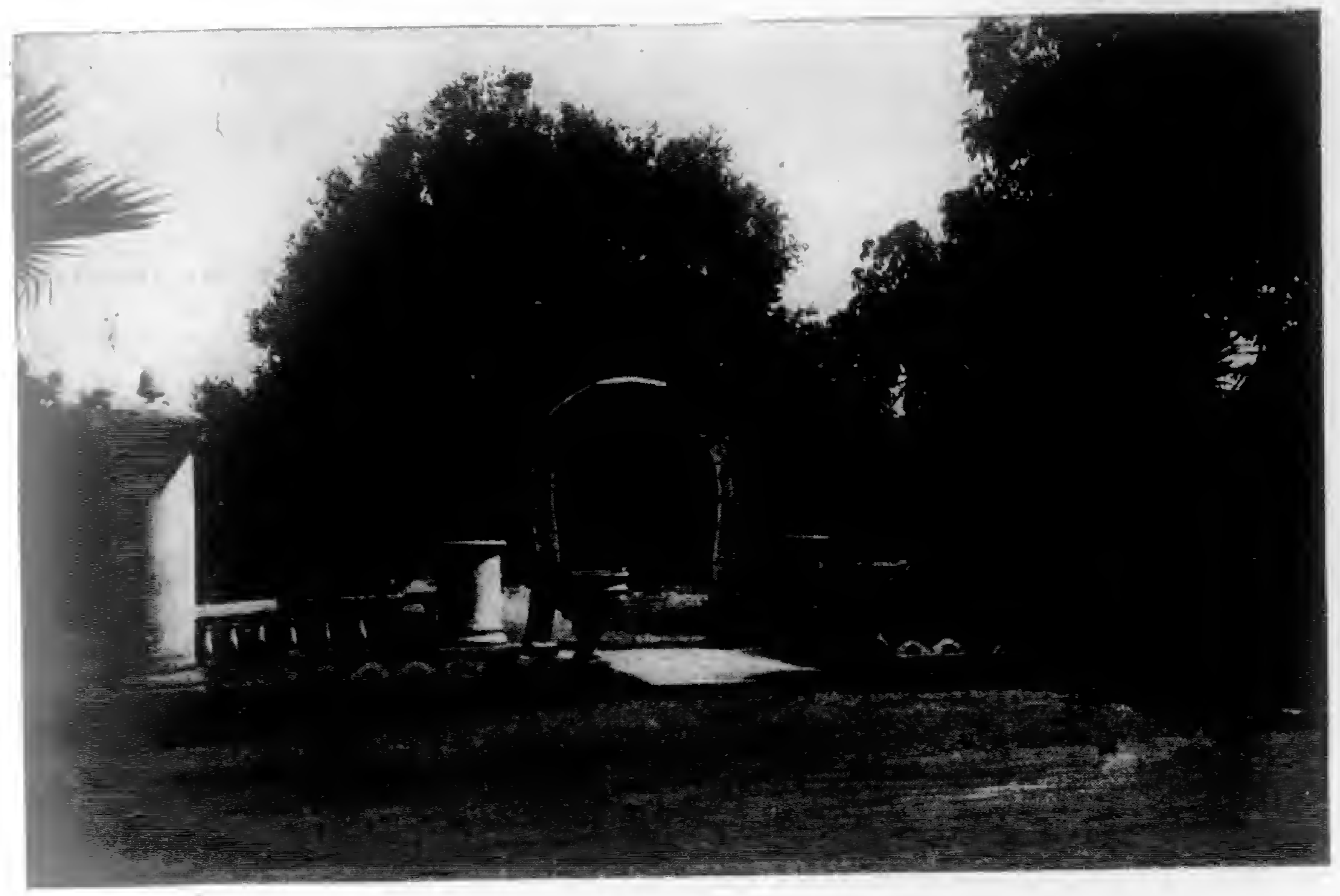
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Concrete Fence and Horseshoe Made at the "Good Luck" Ranch



Concrete Bench and Table Made at the "Good Luck" Ranch

Concrete at "Good Luck" Ranch, California

By MARTIN FESLER, in Concrete

THE accompanying photographs of concrete construction represent work designed and executed in this material by the writer on his property, "Good Luck" Ranch, at Covina, Cal. When the idea first occurred to me to build the large cement horseshoe arch shown here, a symbol of good luck, the complicate nature of the form work necessary to cast the design and the expense of building the form seemed to present a difficult undertaking. It was finally decided, however, to make the effort by casting on the ground. An old galvanized iron box and a few stakes did the trick, and the horseshoe was made and erected, as shown in the photograph, at a cost of less than $5. Four large bolts were placed where the calks appear and wire was built into the base on which the shoe was to rest. When the shoe was set up, the wire securely tied to the bolts and the remainder of the calks completed, it made a continuous line of reinforcement from the base throughout the entire shoe.

The columns shown are 20 inches in diameter and 8 feet high. They are built of irregular pipe. There is now being constructed a concrete pergola extending from the horseshoe to the house, a distance of 103 feet. The columns will be 14 inches in diameter and 10 feet high, with molded caps and base. The beams are 8 by 12 inches, with ornamental ends of the usual pergola type. The cost of the pergola will be far below a similar structure in wood.

Concrete construction in this section of the country is so extensive that it has led to the impression that we surpass other localities in that respect, but the cement journals tell us that the same progress is being made elsewhere. The climate here is such that we find cement especially adapted to the locality. Most of the water for irrigation purposes is now conducted to the ranches in cement pipes. They are made in sizes from 4 to 40 inches and when properly constructed and put down will stand considerable pressure. Cement water troughs for stock, cement urns and other garden furniture are in common use. We are constantly finding cement applied to new purposes.

* * *

The Itemized Account

The following appears on a sign in the window of a wine merchant's shop in New York:

WHAT EACH MAN GETS

From a bushel of Corn the Distiller gets four gallons of Whiskey which retails at	$16.00
The Government gets	4.00
The Farmer who raises the Corn gets	.20
The Railroad gets	2.00
The Manufacturer gets	9.40
The Retailer gets	HELL
And the Consumer gets	DRUNK

* * *

Experience the Great Teacher

"But, Captain Brace, why do they always call a ship 'she'?"

"Lord, miss! you wouldn't ask that ef you'd ever tried ter steer one."—Judge.



Concrete Fence and Horseshoe Made at the "Good Luck" Ranch



Concrete Bench and Table Made at the "Good Luck" Ranch

Concrete at "Good Luck" Ranch, California

By MARTIN FESLER, in Concrete

THE accompanying photographs of concrete construction represent work designed and executed in this material by the writer on his property, "Good Luck" Ranch, at Covina, Cal. When the idea first occurred to me to build the large cement horseshoe arch shown here, a symbol of good luck, the complicate nature of the form work necessary to cast the design and the expense of building the form seemed to present a difficult undertaking. It was finally decided, however, to make the effort by casting on the ground. An old galvanized iron box and a few stakes did the trick, and the horseshoe was made and erected, as shown in the photograph, at a cost of less than $5. Four large bolts were placed where the calks appear and wire was built into the base on which the shoe was to rest. When the shoe was set up, the wire securely tied to the bolts and the remainder of the calks completed, it made a continuous line of reinforcement from the base throughout the entire shoe.

The columns shown are 20 inches in diameter and 8 feet high. They are built of irregular pipe. There is now being constructed a concrete pergola extending from the horseshoe to the house, a distance of 103 feet. The columns will be 14 inches in diameter and 10 feet high, with molded caps and base. The beams are 8 by 12 inches, with ornamental ends of the usual pergola type. The cost of the pergola will be far below a similar structure in wood.

Concrete construction in this section of the country is so extensive that it has led to the impression that we surpass other localities in that respect, but the cement journals tell us that the same progress is being made elsewhere. The climate here is such that we find cement especially adapted to the locality. Most of the water for irrigation purposes is now conducted to the ranches in cement pipes. They are made in sizes from 4 to 40 inches and when properly constructed and put down will stand considerable pressure. Cement water troughs for stock, cement urns and other garden furniture are in common use. We are constantly finding cement applied to new purposes.

* * *

The Itemized Account

The following appears on a sign in the window of a wine merchant's shop in New York:

WHAT EACH MAN GETS

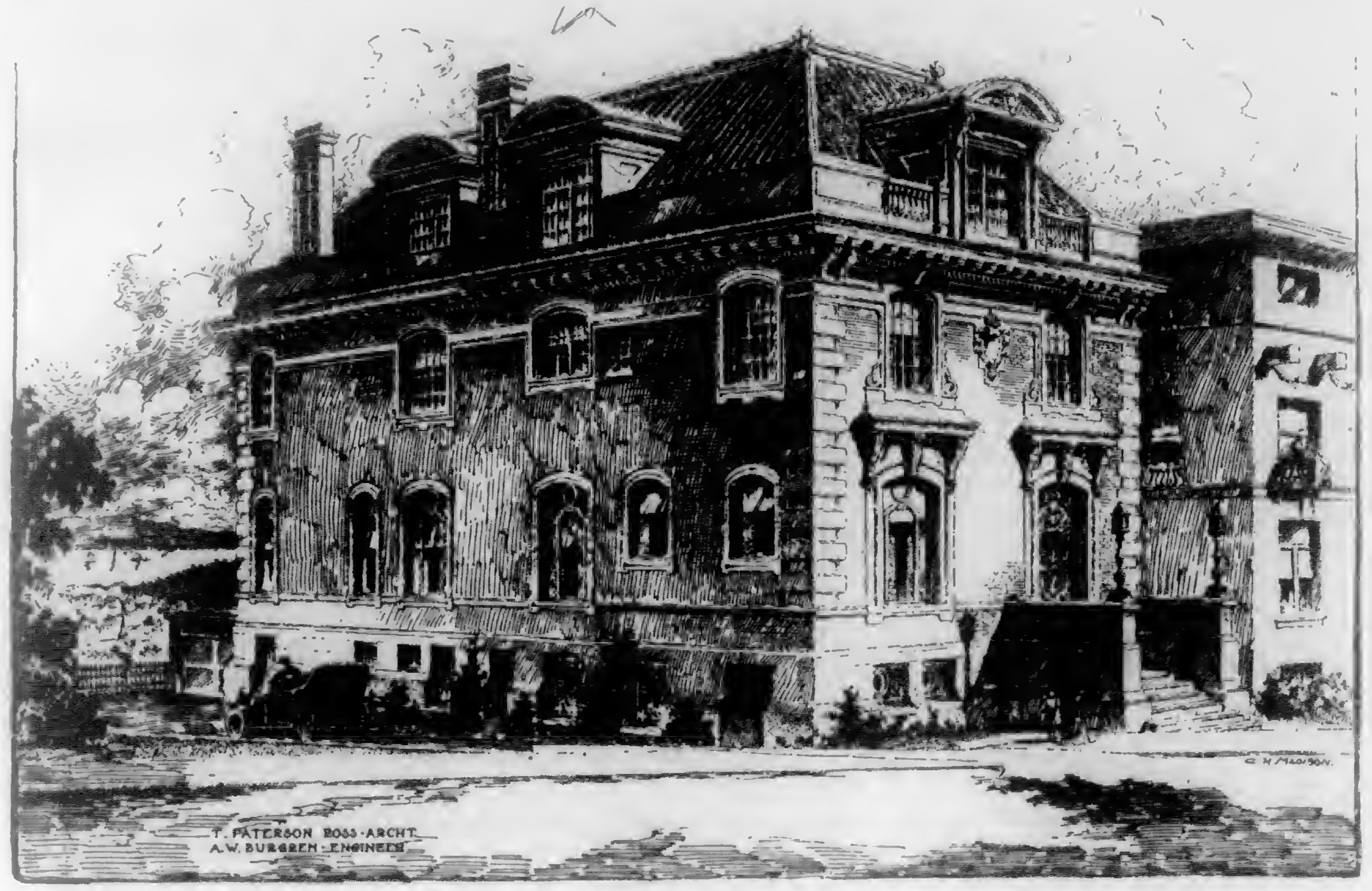
From a bushel of Corn the Distiller gets four gallons of Whiskey which retails at	$16.00
The Government gets	4.00
The Farmer who raises the Corn gets	.20
The Railroad gets	2.00
The Manufacturer gets	9.40
The Retailer gets	HELL
And the Consumer gets	DRUNK

* * *

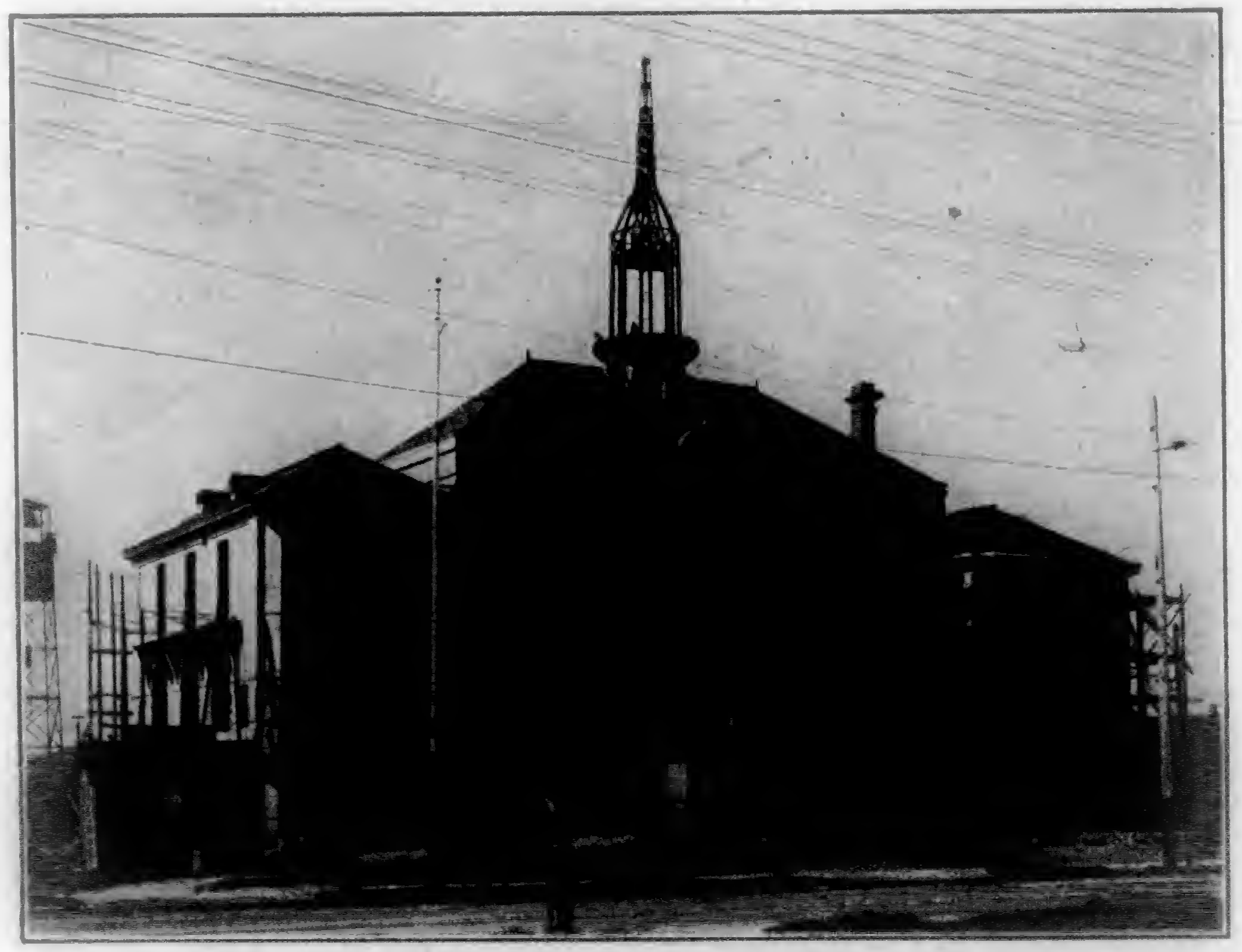
Experience the Great Teacher

"But, Captain Brace, why do they always call a ship 'she'?"

"Lord, miss! you wouldn't ask that ef you'd ever tried ter steer one."—Judge.



T. Paterson Ross. Architect — *Design for a San Francisco Home* — A. W. Burgren. Engineer



Town Hall, Berkeley—Showing Excellent Reinforced Concrete Work
By Rickon-Ehrhart Construction Company
Bakewell & Brown, Architects

Praise for Architect Whittlesey

THE Architectural Record editorially says of the Auditorium building, Los Angeles, designed by Architect Charles F. Whittlesey:

The new Auditorium at Los Angeles—its completion about a year ago almost removes it from the catalogue of "new" structures in that fast-changing city—is one of the most beautiful and notable in the United States. Indeed, the tourist, entering by the broad, marble foyer that circles it, and taking a balcony seat at the side commanding a view of the whole house, is likely to think of Paris rather than of America, and with a shock realizes that the West really has "grown up." For a month in the autumn, grand opera held the boards every week day and night—as it did last year too—and the months when the program is not grand opera, it is something else, less dignified.

But regularly—whatever the ballets or other frivolities of the week—when Sunday rolls around the big auditorium is thronged again, morning and evening. For above all else, the auditorium is the home of Rev. Dr. Robert J. Burdette's Temple Baptist Church, and as such it is a remarkably interesting ecclesiastical structure. Outwardly, it is not churchly. With its nine or ten many windowed stories, its nearly square area—165 by 175 feet—it is more like a commercial structure, or, in the ornateness of its facade, a hotel. The broad and conspicuous marquise is suggestive of a theater; and there are in fact three large auditoriums under one roof, and 150 office rooms, besides committee rooms and various other apartments, so that, being all of these other things which it suggests, it is not strange that modern ecclesiasticism is lost in the shuffle. Still, one day a week it asserts itself within, congregations filling most of the 3000 seats at two services, and a prayer meeting sanctifying the smaller auditorium with its thousand and fifty seats. The service is dignified, and when the notes of the big organ accompany a couple of thousand voices on a familiar hymn, there is an effect that may well make the straying grand opera goer sit up and take notice.

The auditorium was built primarily, it is said, for the church, mainly by the pastor's wife, but no one can help the feeling that the church is in the theater, and not the theater in the church—the better feeling of the two to have, no doubt. Dr. Burdette, who is a plain, little man, is "discovered" in the glare of the footlights to be at "right center," ensconced in a massive gilt and brocade chair, such as De Wolf Hopper would have graced in a royal role, and the very hassock that you would expect, of gilt and brocade, is under his feet. The stage is set for a church scene, even to stained glass windows at the rear, but you know it is all canvas. The Gothic rail behind which the chorus choir is seated on tiers of seats, may be of wood; but if it is it was slid in for the occasion. The Sunday the writer was there the organ offertory was the Intermezzo from Cavalleria Rusticana—quite as if, at a moment when Dr. Burdette was not looking, it had dropped down from the ceiling a relic of the night before.

* * *

An Old Game

"Where have yez been this avenin'?" asked O'Riley of O'Toole.

"Sure, I have been playing 'Bridget whist,' " said O'Toole.

"Bridget whist? An' how do yez play thot?"

"I sit in the kitchen wid Bridget, an' whin Bridget hears the missus comin' she says 'whist.' "



New York's New Municipal Building

Pretentious Architectural Competition for the San Francisco City Hall

A PROGRAM for an architectural competition for the new San Francisco city hall has been arranged by City Architect Newton J. Tharp and it has the approval of the public works commissioners.

Architects all over the world will be invited to present competitive plans. Three prizes, one of $2,500, one of $1,500 and one of $1,000, will be paid for the three plans of greatest merit not accepted, and a prospective fee of about $80,000 net will be given the successful designer of the $3,750,000 building.

In order to insure the participation of a number of efficient architectural firms in the competition, ten payments of $1,000 will be made to ten architects or firms invited by the board of works to take part in the competition. None of the ten is to receive either of the three prizes offered. The plans of all participants in the contest are to be submitted anonymously acording to the rules adopted in United States competitions for postoffice buildings, etc., and are to be presented at a date to be set. Six months after the award is made is the period to be allotted the successful designer for the completion of his working drawings.

Two general alternative schemes are suggested; a group of buildings adopted to the triangular city hall site, and of moderate height, say, five stories; and a monumental building, broad at the base with a central massive tower structure of imposing height, say, 20 or more stories. Competitors may submit plans according to either or both conceptions.

Light California granite for the basic structure, with Indiana, Wyoming or Utah limestone or sandstone for the upper stories, or a suitable California stone to be found, are the materials suggested for the exterior. A steel frame is required and a total space of not more than 6,000,000 cubic feet recommended. A cost of about 60 cents per cubic foot is the general estimate for the structure, or $3,600,000 for the building, leaving a reserve of $150,000 for the unexpected.

* * *

Artistic Treatment of Concrete Surfaces

THE proper treatment to give a pleasing appearance to exposed concrete surfaces has been one of the most difficult problems before the concrete engineer. Many engineers experienced in good concrete work prefer not to attempt to secure perfect finish in the forms, but to dress the entire concrete surfaces by some style of tooling, rubbing or washing process after the removal of the forms. The effort of some architects and builders to overcome the defects of material by making the surface assume the appearance of stone has caused the public to associate with concrete the idea of deception and cheap imitation.

Reinforced concrete structures decorated with exterior ceramic mosaic or enameled tile will be the future method of constructing our important buildings, as well as the mechanic's dwelling houses. The time is not far distant when architects will agree that concrete with ceramic embellishments is equally as valuable a medium of artistic architectural expression as any of the older building materials.

French architects have already declared that because they are nonporous to moisture, gases or dirt, the use of enameled tile in exterior work will prove the eventual solution of the problem of deterioration and discoloration of most of our present building materials when exposed to the atmosphere of large cities. The tiles form an artistic and lively treatment, the effect of which is only accentuated by the increasing surface dullness of the concrete background. The use of decorations has been limited principally to a facing put on the wall after the completion of the structural work, but by the employment of a patented invention, which bids fair to prove one of the greatest building improvements of the age, the ornamentation is now placed in position while the concrete is being poured, thus forming a part of the wall. The tiles are taken as they come from the factory on paper sheets and pasted face down to a perforated steel plate with a patent solution, on a workbench nearby, which after drying is set in position in the wall ready for the concrete backing, thus becoming a part of the wall, instead of a covering. After the concrete has set the proper length of time, the paste is readily dissolved by water forced through the holes in the plate. The plate and paper are easily removed after a few minutes' application of water, leaving an artistic finished surface, at a fraction of the cost when tile is placed with mortar and trowel.—Concrete.

* * *

The fires of faith, hopefulness and true courage rapidly consume all obstacles that lie in the path of progress.

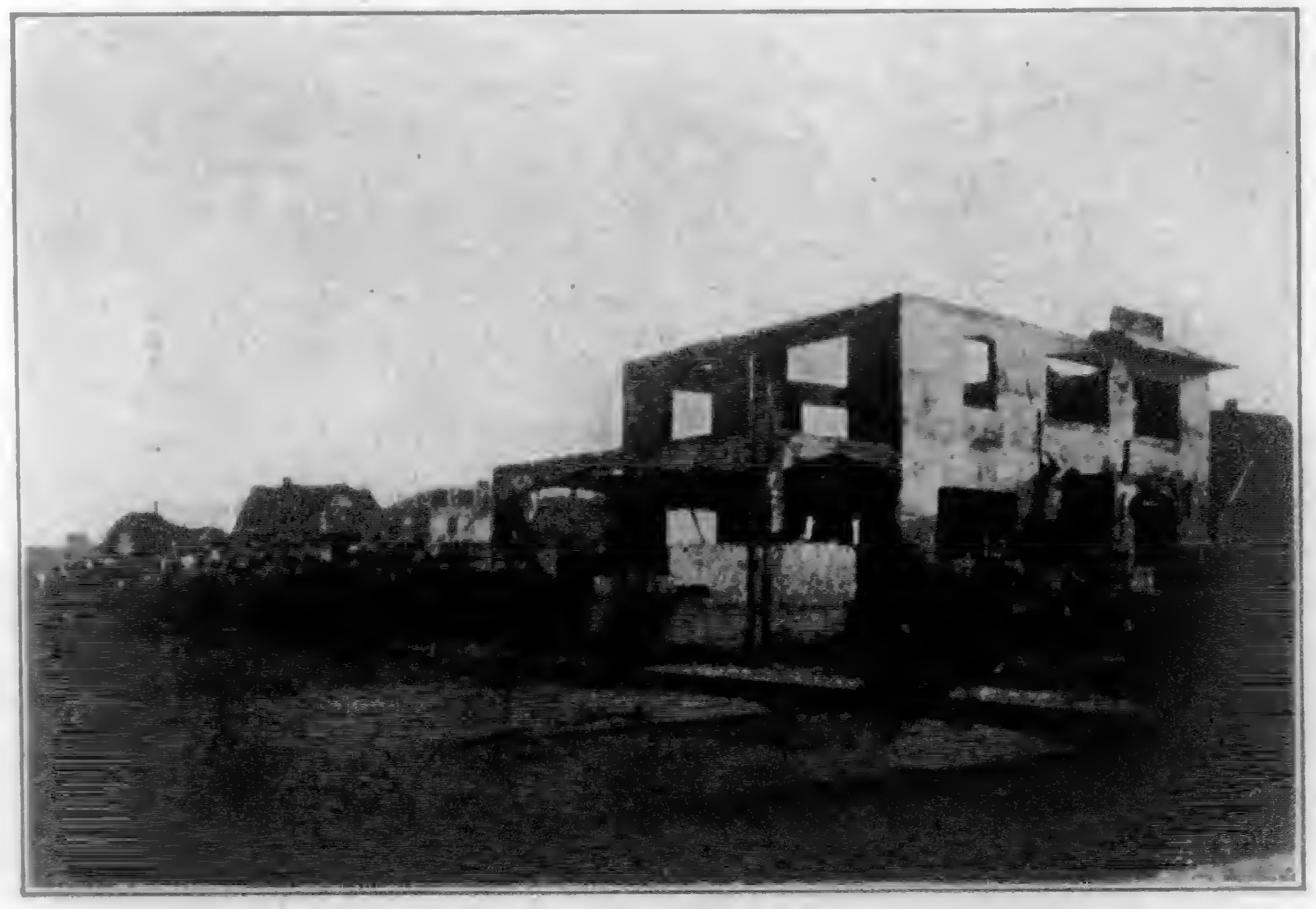
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Let us come out from the shadows of selfishness and stand in the warm sunshine of self-sacrifice for awhile.

Concrete Stands Severe Fire Test

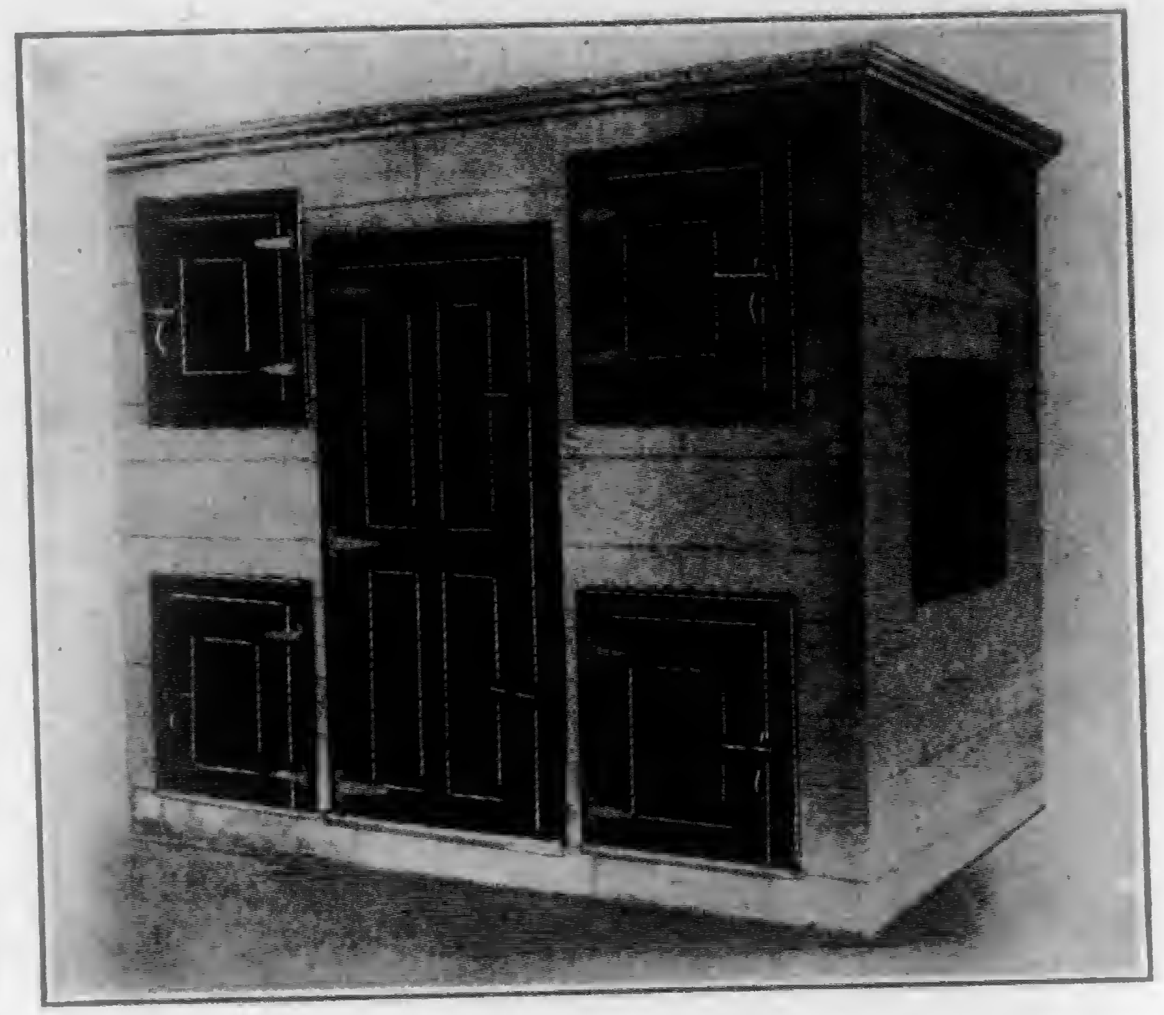


Concrete Cottage at Winthrop Beach, Mass. The Flames Breaking Through the Roof



Concrete Cottage After the Fire. Walls Unimpaired, Interior Entirely Destroyed

A Concrete Refrigerator



CONCRETE is one of the poorest known conductors of heat and cold, yet very little practical use has been made of this knowledge, particularly in the manufacture of articles requiring the use of small quantities of cement. We are glad to call attention to the accompanying photograph of an ice chest, built of concrete blocks. Being built in 1904, the refrigerator has been in use for four years, and has given perfect satisfaction. This particular chest is built with only two compartments, but concrete lends itself so readily to any form of construction required, that shelves and divisions can easily be placed wherever the use of the refrigerator requires.

Nor is it necessary to build of concrete blocks. Concrete is an ideal material with which to build an ice chest of monolithic construction.—Concrete.



A Cyclone Cellar of Concrete

The Architecture of Mexico*

By W. GARDEN MITCHELL, Architect.

IN the first part of this lecture, published some months ago in this magazine, I discussed principally the architecture of the churches, pointing out that religious architecture dominates all other manner of building even as the religious life of these parts controls or at the period these churches were erected controlled every effort or endeavor of the individual or state. Nevertheless it is not to be inferred that the expenditure of the best efforts on church architecture left nothing that was good or suitable for humbler buildings. On the contrary, the taste developed by the erection of these fine churches became the natural education of the humbler citizens as well as the more cultured rich, so that in Mexico, whether it be church or palace, mercantile building or the modest homes of the poor all are in good taste and admirably perform that purpose to which they are assigned.

Of the private palaces one of the most interesting is the house of tiles, the former residence of the Conde de Orizaba. The house is three stories high, the openings are low and broad, and surrounded by mouldings in stone. Between the window openings and at intervals horizontally; molded bands of stone divide the facade into well proportioned panels. These panels are completely filled with tile work in beautiful color and design, as if, perchance, a Persian rug had been fitted to the wall. It is a charming example of the use of tiles in exterior decoration, bronze balconies at the window openings give additional interest to the facade.

Another palace with a magnificent doorway, and over window is that now used as a place of business by Wells, Fargo & Co. The details of this doorway exhibit in a striking manner Aztec influence in decoration. The house of the masks is also a fine example of extravagant domestic architecture, here we have the same elaborately carved pilasters with figures, Cupids supporting the capitals and cornices, and finally the water-spout. These divide the frontage on two streets into about twelve bays with central door. The window openings are also uniquely decorated in carved stone, the barred windows of the lower story being as customary an additional feature.

Coming to the plan of these buildings and excepting churches, we may say that the Mexican house, whether it be palace, convent, city hall, college or simple residence, always contains a patio and is entered, whether it be a large or small building, by a great door.

Guadalupe in Patio

The patio may be one or two or three stories in height and may be surrounded by simple walls or a series of balconies carried on arches and columns. In the center, perhaps, a fountain or a well.

The sun shines fiercely in Mexico and at mid-day all labor ceases. Then it is that the traveler repairs to his hotel, the merchant to his house, and the artisan to his home. Passing through the great doorway he is at once in the midst of the soft restfulness of green foliage and bright flowers, for every patio is the garden of the Mexican. Above the blue sky but the shadow of the surrounding walls protects him from the heat of the day. Here beneath the arches of the projecting balconies he may enjoy his mid-day meal and smoke his never-to-be-omitted cigarette. The doors and windows of the surrounding rooms open directly on the patio so that he can live an outdoor or indoor life at pleasure, according

* Lecture given before the members of the Architectural Club.

to the time of day. The temperature at certain times of the year drops rapidly after nightfall, so that after dark the patio is deserted in favor of the warmer rooms. The patio is a most fascinating feature of Mexican architecture and I cannot see that in this country of California it is not also most suitable. The floor of these patios is invariably paved with stone or tile, generally stone. Fountains and plants in many coloured and handsomely designed pots decorate the floor space while climbing to the eaves above, the magnificent majenta of the buganvillia vies with the intense blue of these tropic skies. We talk of being a practical people but nothing in the way of residence could be more practical than this combining of art and nature, earth and sky, as in these patios and I think the twenty-story building, or even the ten-story, the conception of a dreamer a frenzied dreamer as compared to the acknowledgment in low buildings that man to remain well balanced and on substantial ground must not remove himself far from nature. Separation from nature leads to artificality of life, the destruction of a people, contact with nature to that happy union in which the one enhances the value of the other.

We have in California an idea that tile roofs form a conspicuous feature of Mexican architecture but this is not the case. It is the table-land of Mexico that truly represents her architecture not the low country of the coast, the terrano calentes. All over the table-land the tile roof is conspicuous by its absence. The roofs are almost invariably flat except in churches in which they are invariably vaulted. These flat roofs are formed of bricks laid in mortar resting upon dry earth, boards and joists. The parapet is generally a straight line with small molded coping nothing more, no cornice, but the openings are well proportioned, generally surrounded by stone, both at door and window. The windows are invariably barred, and the entrance door which always leads to the patio is in all cases ample. In the older Mexican houses of any importance the entrance door was always large enough to admit the coach, and a small door in the woodwork of the great door was provided for the use of pedestrians. Of these doors there are many fine examples in Mexico. A niche for the virgin or a cross frequently surmounts the door. Now in all this architecture of Mexico the use of large spaces of repose is much in evidence. Great walls with few and small openings, but the Mexican is not satisfied with form only and these plaster surfaces become a fine field for the colorist. Sometimes the whole frontage is framed as it were with a stencil and enclosing bands of color, up its extreme sides and a cross, at, say the level of the waterspouts; also at the window openings colored decorations in bright hues or delicate tints are used, while the whole brackground may be pale pink or bluish green, or again if there is no special decoration, the whole save the red or grey stone of the openings may be amber or orange color, every tint of the spectrum or the tint of dawn or evening. In most cases, however, it is a tint and not a deep or bright or strong color that is used. With the varying light of day, from the fierce sunshine of noon, which almost obliterates all color from these walls to the golden beams of sunset, these streets of Mexico present a never ending interest in color to the artist's eye. Rose pink, pale blue and bluish green with yellow and red occasionally are the colors most in favor, but the Mexican understands the art of coloring his plastered walls tinting them to perfection and time which renders them mottled only adds interest to the scheme. The low country is the land of the tile roofs, but in these hot and humid zones effort is irksome and there are few buildings of architectural merit in the terreno calientes. The

buildings are more of the bungalow type, one or two stories high with great projections of the eaves. The walls are covered with stucco and the red tiles are of the shape used in our Spanish Mission buildings of California.

They are generally picturesque but exhibit little worthy of comment architecturally. One thing one does not see in Mexico is a certain style of architecture which is known here as the Spanish Mission style, in which about three feet of tile roof is stuck against the front wall of the building so that the enlightened may know that it is Spanish. I have never seen anything like it in Mexico, and I would be pleased to think that I had never seen anything like it here. You find garden walls and narrow gateways protected with a small roof in Mexico, but the building is either entirely covered with tile roof or no roof shows itself above the walls of the parapet. Some of the larger drawings of detail which I have made, particularly those of the Segrarie, San Luis Potosi, and El Carmen, in the same city, show how interesting and good much of this ornament is. The design is not repeated mechanically, yard by yard, and to be exact, it does not repeat at all.

I think the birds and grapevines of the Segrarie particularly good. So free and original in style. They remind one of the embroideries on a Japanese piece of silk work. The Runic ornament over the niches of the Church of El Carmen, the projecting ornaments of the arch stones of the main door and the vase from which rise the twisted columns of the side door of this church are also interesting.

In wall ornamentation in raised plaster, somewhat Moorish in character, there are a few examples in the City of Mexico. The whole surface is covered with design in geometrical pattern. Time and the frequent repainting with watercolor or some such material with which the Mexicans color their walls, has softened the edges of these reliefs, so that the whole blends in most pleasing effect. Of things that were new to me, this decoration is one of them, but one can gather many new ideas in Mexico. There is for example the door with octagonal head as in the Cathedral of San Luis Potosi and the gateway to the new post office in Mexico City. Stencils, tile-covered walls and domes, bands of color along the walls in place of projections. Garden walls, in which panels are filled with Moorish fretwork in burned clay, and so forth, and many others of which time will not allow one to speak, but let us leave the study of buildings, that is houses, and take to the street and to the highway.

Fountains form an interesting feature in Mexico. Ever since the time of Rebecca, the well has formed an important adjunct to every community and even to this day in Mexico the water for most part is obtained in the same manner, as in the days when Jew and Samaritan drank at the well of Samaria. In some instances an open aqueduct carried on many arches led the water from the mountains over the arid plains. It was so until recently in the City of Mexico and the Salto del Agua or outlet of the water, as illustrated in one of my sketches, shows one of the most important and elaborate of these fountains. Near this the Great Brasaro of Inquisitorial times, even to the beginning of the last century, was wont to burn.

The Caja del Agua San Luis Potosi is also a fine example of a fountain. Here the women of the city come with their ollas of brown and, of red pottery, to draw water, chat for a moment or an hour as necessity or fancy may determine and then deftly poising these on head or shoulder, glide softly away while others take their place, for in the evening all come to draw, and the fountain is a great place of rendezvous and gossip.

Shrines are also numerous in Mexico, and on the causeway from Mexico to the shrine of the Virgin of Guadalupe, the patron saint of Mexico, many shrines beautify the miles that lie between the city and Gaudalupe.

Stone Benches an Interesting Feature

Benches are also another interesting feature of city life in Mexico. These are always of stone, sometimes straight, sometimes circular in form, round a grorietta or small circular plaza. In some instances they are built of rough stone and plastered. The arms and copings only being of exposed stone, the balance plastered and colored, a Pompeian red or other tint. At other times as in Mexico City, on the Paseo de la Reforma, they are of more handsome design with great square posts at intervals surmounted by large vases, and above the back rest, fretwork panels, carved in stone, give interest and protection from the wind. The bench is generally raised one step above the ground level. Arcades or portales are also another interesting feature, these generally are to be found fronting the central or other plazas. Here the upper stories project over the sidewalk and are carried on a series of arches forming an arcade. Venders of candies, fruit, gee-gaws, ribbons, and what not, congregate under these arches, or rent small kiosks, or stalls, as in the central plaza in Mexico City. These arcades protect from the sun at the heat of the day and from the rain in wet weather.

The baths of Agua Caliente must not be passed without notice. The water is naturally hot, small rooms, say fifteen in number, face a gallery or corridor of arches which overlook a delightful garden. The baths or tubs are of Roman type, simply wells sunk in the floor of the room with about four steps leading down into them. Each cell contains sufficient space for dressing and undressing. Along the gallery or arched corridor are placed stone benches where after bathing one can sit and cool off, converse and smoke. The details of this building are particularly beautiful, and the benches along the garden enclosure are quite unique. Gateways are also numerous, especially in front of churches. The gateway in front of the church of El Encino Agua Caliente, Moorish in design, or feeling, is particularly good and very original. To give you some idea of the color of which I speak I submit a sketch of the convent church of Chirabusco, near Mexico City. This also shows something of the use of tiles as employed by the Spanish Mexicans.

Puebla is the great city of tiles, but I am sorry to say I did not visit that city so cannot show anything of its wonders. Well, it is difficult to describe that which can only truly be understood by the eye, but if I have succeeded in arousing an interest in this architecture of Mexico, and shown to you, that right at our very border lies a country well worthy of a visit, almost as much so as some of the countries of Europe. I shall be satisfied, both for your sake and for the credit of that artistic and energetic people, who not only brought civilization to Mexico but gave of so much of their talents in these wondrous days of the Renaissance.

No architecture, in my estimation, is more suited to our immediate needs in this country of California than those types to be found in Mexico, and although I doubt not that in Old Spain even better models are to be found, if we cannot travel into distant Spain let us not overlook this treasure land of architecture that lies right at our very doors.

* * *

There are some people so mean that if they got a free reserved seat in heaven they would sell it to a speculator.

Forms for Concrete Construction*

By SANFORD E. THOMPSON, Consulting Engineer

RECENT failures in reinforced concrete construction cannot be cast one side and forgotten with the passing comment so frequently heard that the accident was due merely to poor construction or too early removal of forms. The reasons for every failure should be thoroughly investigated by experts to prevent recurrence of similar accidents.

"Forms," although frequently guilty, are by no means the only culprits. In fact, they are frequently blamed when the designer is at fault. Just so long as men who know nothing of the first principles of mechanics are permitted to design concrete structures, and just so long as irresponsible contractors are engaged to erect them, the list of accidents will increase in startling numbers. In every case it is the men, not the inanimate lumber and materials, who are to blame. However, granting its danger under ignorant hands, reinforced concrete as a whole must not be condemned for failures due to improper conditions any more than brick should be rejected as a building material for apartment houses because of the collapse of several unfinished buildings in New York City two years ago through disregard of frost action upon the mortar.

Failures in concrete buildings may be attributed to:

1. Imperfect design; especially through neglect of essential details in locating the reinforcing metal and through the adoption of too low a factor of safety.
2. Poor materials; such as cement which does not properly set up, or sand which is too fine or which has an excess of clay, loam or other impurities.
3. Faulty construction; from improper proportioning, mixing or placing, or too early removal of forms.
4. Weak form.

A disregard of such important principals is frequently criminal negligence, and yet in at least one case under my observation an examination of the structure and the materials, after a collapse in which a number of lives were lost, showed both the design, materials and construction so faulty that it was impossible to decide positively which of the four causes named above was the primary reason for the failure.

In this paper it is proposed to treat only of the design, construction and removal of forms.

Kind of Lumber

The selection of the lumber must be governed by the character of the work and the local market. Although white pine is best for fine face work, and quite essential for ornamental construction cast in wooden forms; for ordinary work, however, even for the panels, white pine is apt to be too expensive, and spruce, fir, Norway pine or the softer qualities of Southern pine, especially North Carolina pine, must be substituted for it. Some of these woods are more liable to warp than white pine, but they are generally stiffer and thus better adapted for struts and braces.

Kiln dried lumber is not suitable for form construction because of its tendency to swell when the wet concrete touches it. Very green lumber, on the other hand, especially Southern pine, which does not close up quickly when wet, may give trouble by joints opening. Therefore, the middle ground, or, in other words, partially dry stuff, is usually best.

*Paper read at the Chicago Meeting of the National Association of Cement Users.

Finish and Thickness of Lumber

Either tongued and grooved or bevel edged stuff will give good results for floor and wall panel forms, and is preferable to square edged stuff. A smoother surface may be attained at first with the tongued and grooved stock, and there is less trouble with opening joints, but it is more expensive than bevel edge because of the waste in dressing, and if the forms are used many times there is greater tendency to wear at the joints. Even for rough forms plank planed one side may be economical to cheapen the cost of cleaning. Studs should always be planed one side to bring to size.

The thickness of lumber varies with different contractors, some using 1-in., others 1½-in., while a few employ 2-in. stuff even for panels. (These are commercial thicknesses measured before planing.) For ordinary walls 1½-in. stuff is good, although for heavy construction where derricks are used 2-in. is preferable. For floor panels 1-in. boards are most common, although if the building is eight stories high or over, 1-in. stuff is likely to be pretty well worn out before the top of the building is reached, and the under surface of the concrete may show the wear badly. For sides of girders either 1 or 1½ in. is sufficient, while 2-in. is preferable for the bottom of girders. Column forms are generally made of 2-in. plank.

Certain general rules are applicable to all kinds of forms. Strength, simplicity and symmetry are three fundamental principles of design. The necessity for strength is obvious, while economy in concrete construction consists in quickly erecting and moving the forms and in using them over and over again.

The design of the concrete members should recognize the forms. A slight excess of concrete sometimes may be contributed to save carpenter work. Frequently beams may be designed of such widths as to use dimension widths of lumber without splitting.

Columns may be of dimensions to avoid frequent remaking. Panel recesses in walls may be made the thickness of a board or a plank. To permit ready cleaning of dirt and chips from the column forms before laying the concrete at least one prominent contractor provides a door at the bottom of each of them.

Design of Forms

In building construction the forms must be designed so that the column molds and also the bottom of beam molds are all independent of the slabs. The forms may thus be left a longer time upon members subjected to the greater stress.

The sides of the beam molds should be held tightly together by wedges or clamps to prevent the pressure of the concrete springing them away from the bottom boards. At top or bottom of each strut hardwood wedges are useful when setting and removing it, and also permit testing to make sure that there is no deflection of the beam or slab. For this purpose some contractors loosen the wedges 24 hr. in advance of the struts. In general it is preferable to use comparatively light joists, such as 2 x 8 in. or 2 x 10 in., with frequent shores, rather than to use lumber which is heavier to handle.

If forms are to be used but once or must be taken apart when removed it is sometimes practicable to use only a few partially driven nails, so that they can be withdrawn without injury to the lumber.



Designs for Inverted Gas Light Fixtures

Inverted Gas Lighting Fixtures

THERE is a common saying that "Imitation is the sincerest form of flattery." To imitate the electric lamp is to acknowledge its superiority; why should the gas people wish to imitate it? The inverted mantle burner is a positive improvement in gas lighting. It gives a somewhat higher absolute efficiency, and a better natural distribution of the light. These are good and sufficient reasons for its existence, and it has no need to make excuses by posing as an imitation. It is quite as susceptible of artistic treatment as the electric lamp, and the quality of its light is every whit as good.

The American manufacturer has apparently ceased to devote his constructive and creative abilities to the design of fixtures for gas illumination. As examples of American ideas therefore, either the fixtures that were designed years ago must be taken, or electrical fixtures which, by simple changes, could be adapted to gas lighting. In Europe the conditions are quite different. Gas lighting is still a subject for the best efforts of the fixture designer, and the prevailing ideas of decorative art as applied to fixture construction are found exemplified quite as much in gas fixtures as in electric.



Testing Floor in State Hospital Building, Agnew. Beach Sand, Tile and Weight of Workmen Exceeds 70 Tons

Concrete Buildings at Agnew Stand Severe Test

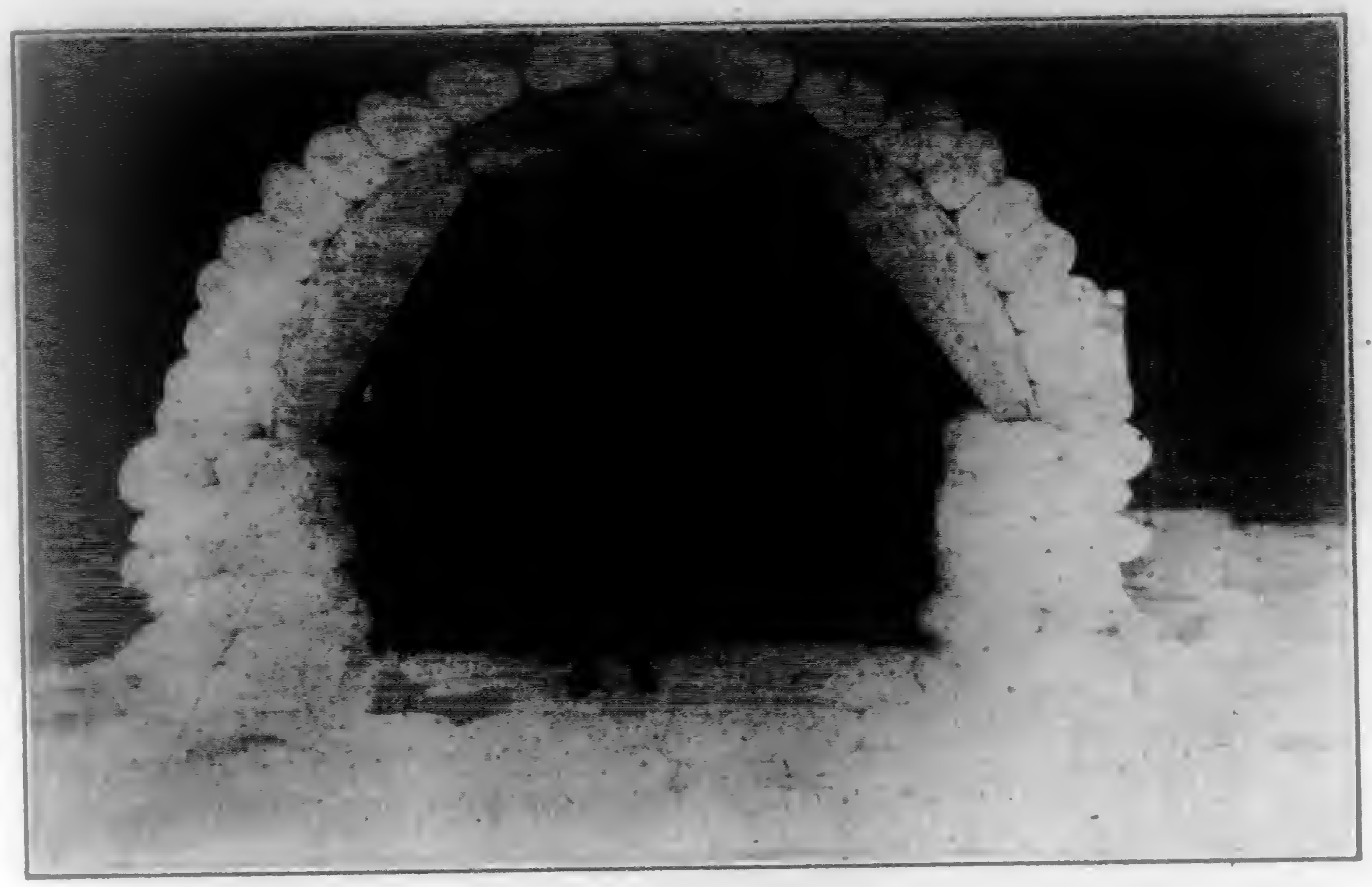
THE illustrations shown herewith, taken from actual photographs, give a fair idea of the thoroughness of the tests made recently in the Receiving Building at the Agnew State Hospital. The tests followed sensational charges against Contractor F. O. Engstrum of faulty concrete construction, preferred by the California Building Trades Council. The public was led to believe that the building had been so poorly constructed that it was likely to collapse at any time, causing death or injury to the hundreds of inmates.

The tests proved to the satisfaction of State Engineer Ellery, who was commissioned by the Governor to investigate the charges, that the contractor had not skimped the work, that proper proportions of sand, gravel and cement were used in mixing the concrete, that the reinforcing material was in every way satisfactory, and that the few apparent defects in several of the beams and walls were of outward consequence only and in no way impaired the strength of the structure.

The State Engineer is thoroughly satisfied with the tests and the testimony of the expert counsel that was called in by Mr. Engstrum.

Speaking of the charges, Mr. Engstrum declared that the Building Trades Council had three points to gain in the attempt to discredit the company and the character of its work. He said:

"First, retaliation on account of our successfully out-generaling them for the last ten years in Los Angeles, and having successfully defeated them in San Diego, in Pasadena, Colton, Long Beach, Venice, Santa Barbara and many other places, where we have been putting up many large buildings of almost every description, from a bungalow to the largest



Test of Concrete Floors in State Hospital Building, Agnew, Cal.



The Floor of this Room Carries 6½ inches of Damp Sand at a Weight of 91 Pounds to the Cubic Foot. 294 Sacks of Cement Weighing 103 Pounds per Sack and 20 Barrels of Cement Weighing 300 Pounds Each. Each of the two Floor Slabs is Supported by two Reinforced Concrete Beams and Each Beam by one Reinforced Concrete Pillar. Total Weight, 70 Tons

office buildings, apartment houses, warehouses, etc. They desired to give us all the trouble they could and cause us all the unpleasant notoriety possible.

"Second, on account of entering the San Francisco field, which they did not care to permit us to do, knowing a firm of our magnitude could and would carry out our contract successfully, thereby keeping some union firm or union contractor away.

"Third, by making a strong fight on us it would have a tendency to show other outside contractors, who might have a desire to bid on work in San Francisco and that vicinity, that the unions would cause them all the trouble in their power and prevent them encroaching into their stronghold.

"The domination of the unions and their methods of carrying out their principles has already been a great drawback to capitalists and the investing public, especially in the vicinity of San Francisco. We have built our business upon the open shop principle and we have been successful. We are now recognized as the largest contracting firm west of Chicago, having all departments complete and well organized, and we have saved the State on the Agnew job alone over $20,000. We have fought our battles alone against every department of the union, one at a time, in the last few years, and we have just won a battle against the complete State organization in the very midst of their union principles and in their own union town."

* * *

The Wonderful Increase in the Use of Tiles

By W. W. FUNGE, JR.

DURING the past few years, and more especially the past two years, there has been a wonderful increase in the amount of tiles used for floors and walls in the Pacific Coast territory. Since the manufacturers have made such a large reduction in the price of ceramic mosaic tiles for floors, there has been scarcely anything else used but this class of tiles in buildings that formerly used marble mosaic, terrazzo and numerous substitutes. It is now possible to get a beautiful design in ceramic mosaic floor for about the same price as was formerly asked for marble mosaic, and as the former is so infinitely superior for durability and in richness of color and design, it is no wonder that they should have displaced other kinds of floors of this class, and it is quite certain that the day is not far distant when all floors that are subjected to any considerable use will be paved with tiles. Indeed, there are many countries that now compel the use of tiles in certain places for sanitary reasons and as a protection against fire and water. Even our battleships use large quantities of tiles in several departments.

In San Francisco there are several buildings that have been entirely veneered with tiles, and there is a tile on the market now known as brick-tile that is so superior to all others for veneering building exteriors that a great demand has been created for it. These brick-tiles have a dovetailed mortise anchor in the back of them, formed in the process of manufacture, that actually rivets each piece to the wall as effectually as if it was bolted. The standard size is 9″ x 3″, but they are also made in numerous special shapes and lengths to make returns and panels, as well as different shapes for sills, etc. An entire front can be made of this product. A notable example of this is the recently completed California Market, designed by Architect Herman Barth. Both the Pine and California street frontages



Majestic Theatre and Office Building, Los Angeles
Edelman & Barnett, Architects

are executed in brick tile of a beautifully soft jade-greenish shade, with a base of rich mossy green that is positively a delight to the beholder. By many, this market is pronounced the finest in the United States or even Europe. The interior is tiled in a lavish manner, too.

What a splendid article these brick-tiles would be to rehabilitate an old brick building. They are easily and quickly applied to old brick walls and it is only a question of time till there will be a great deal of this work undertaken. The old drawback to the use of tiles is overcome in the anchor back above referred to. If, by way of extra ornamentation, something in art ceramic mosaic entablatures is desired, there would be very little extra cost, as art mosaic can now be had in any design and color scheme that is wanted.

* * *

Too Risky

"I think from the utensils about him that this mummy must have been an Egyptian plumber."

"It would be interesting to bring him back to life."

"But too risky. Who's going to pay him for his time?"

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter, American Institute of Architects, was held in the Blue Room of the Hotel St. Francis on Thursday evening, February 18th.

After dinner, business of interest to the profession was transacted. Resolutions endorsing the Newlands bill for the location of the Lincoln Memorial at Washington were adopted; also resolutions endorsing the action of President Roosevelt in appointing a council to advise and suggest regarding the Bureau of Fine Arts.

At the conclusion of the business portion of the meeting Mr. R. B. Guernsey delivered a very interesting address on "Heating and Ventilation," which was fully illustrated by carefully prepared diagrams. Mr. Guernsey was listened to with great attention, and at the close of his remarks received the thanks of the Chapter.

New Partnership

Charles S. Kaiser, who came to the Pacific Coast soon after the San Francisco fire to work out some of the details of the new Olympic Club building, has associated himself with the well known firm of Oliver & Foulkes, Crocker building, San Francisco, and the firm name will hereafter be Oliver, Foulkes & Kaiser. Mr. Kaiser is a student of McKim, Mead & White, New York. Mr. F. Hildebrand has also become associated with Messrs. Oliver & Foulkes.

Another Brick Relic.

Gust Haut, of Perham, Minn., a brick manufacturer, cherishes a souvenir of his visit to his native village of Saal, Germany, six years ago, in the shape of a brick from the ancient church there, which was constructed in A. D. 1240. When he was there some repairs were being made which involved taking down a portion of one corner. Mr. Haut took advantage of the opportunity to secure one of the bricks.

The brick was hand molded, and is of a dark red color. The size is somewhat different from the present size of bricks, being 11x5x3½ inches, and weighs twelve pounds. One side and one end have been exposed to the weather for over 650 years, and they still show no more signs of wear and crumbling than relatively new brick.

Terminal Depot for Oakland.

Oakland is to have a new terminal station from plans by Architect Patterson of the Southern Pacific Company. The depot will be erected this year on the site of the old Sixteenth-street passenger station. It will be constructed of steel, stone and brick and will have a train arcade more than 300 feet long. Provision will be made for a double overhead track system. A viaduct from the second story of the station will be used exclusively for the new electric-train local service between Oakland mole and Berkeley. The surface tracks will be used exclusively for the main-line traffic.

Architects Move.

Jeffery, Van Trees & Millar (Inc.) and Maginnis & Walsh, architects, of Los Angeles, have removed their offices from the fourth floor to the sixth floor of the Citizens National Bank building, Third and Main streets, Los Angeles.

Architects William Curlett & Son, have moved from the Mutual Bank building to the Phelan building, of which latter structure they were the architects. Curlett & Son were tenants of the old Phelan building before the fire.

Architect Weeks' Bereavement.

Architect Charles Peter Weeks, of the firm of Sutton & Weeks, Mutual Bank building, San Francisco, has the sympathy of the profession in the death of his wife, which occurred late in January. Mr. Weeks has gone East for an extended stay and before returning to San Francisco will visit Panama.

Bids Rejected for Dry Dock.

A dispatch from Washington states that the bids for the $2,000,000 dry dock at Hawaii have been rejected, will be revised and new proposals called for. C. M. Leach of Boston was the lowest bidder, but he refused to qualify and the next lowest was by the Pacific Construction Company of San Francisco. The Pacific Construction Company bid was in excess of the appropriation, hence the necessity of calling for new bids.

Signs of Spring.

Porterville.—The Novelty Theatre, W. J. Godley, manager, Porterville, will erect a theatre building on Main street.

Fruitvale.—The Masons of Fruitvale will erect a Masonic Temple, 75x115 feet, three stories, on East Fourteenth street.

Hanford.—The Church of Christ, Hanford, will build an edifice at Myrtle and Irwin streets.

Santa Rosa.—W. B. Ward, of the firm of Moke & Ward, will erect a residence at B and 7th streets, Santa Rosa.

Santa Cruz.—David L. Wilson, of the firm of Brown & Wilson, will build a handsome residence on Laurel street, Santa Cruz, early the coming spring.

Bishop, Cal.—W. B. Sollender will build a large hotel, the first story of granite. A private electric power plant will be installed.

Berkeley.—W. L. Wood, lumber dealer of San Francisco, will erect a $7,000 residence at Plaza Drive and Encinal Place, Claremont.

Coalinga.—The First National Bank of Coalinga will erect a two-story Roman brick building, 25x85 feet, on Fifth street.

Architect Weeks Busy.

Architect William H. Weeks of San Francisco and Watsonville, has plans out for the new Y. M. C. A. building at Watsonville, Cal. The structure will be of brick, two stories, and will contain an assembly hall, to seat 250 persons, gymnasium with concrete plunge bath, lined with tile; eight shower baths, five tub baths, gymnasium paraphernalia, lockers, etc.

Mr. Weeks also has plans out for an eight-room school house to be built at Watsonville, and for which $40,000 was appropriated recently. The building will cost about $30,000 and the remaining $10,000 will be used for repairing two of the old buildings and equipping them with modern heating systems.

Architects' Meeting.

The Southern California Chapter, A. I. A., held its regular monthly dinner and business meeting in Levy's cafe, Los Angeles, with twenty-five members in attendance.

Mr. W. S. Eames, a prominent St. Louis architect, and a past president of the American Institute of Architects, was the honored guest of the Chapter, and gave a very interesting and instructive talk on architecture and the good work being accomplished by the institute.

Octavius Morgan, Alfred F. Rosenheim, Myron Hunt and Fernand Parmentier, delegates of the Southern California Chapter to the national meeting recently held in Washington, D. C., each presented a short narrative of what transpired at the convention.

Stanford Memorial Chapel.

Architects Meyers & Ward, Kohl building, San Francisco, state that the plans for the steel work for the reconstruction of the Memorial Chapel at Stanford are well under way. The entire building is to have a heavy steel frame, and the stone facing is to be backed up with reinforced concrete walls which will be securely tied to the steel. The architecture of the old building is to be retained as far as possible, and much of the old stone and mosaic has been saved and will be used again. The tower is to be eliminated, but a scheme has been devised for retaining the clock.

Prize for Best Trophy Design.

M. Robert Guggenheim has offered a trophy valued at $2,000 to the winner of the big automobile race from New York City to the Alaska-Yukon-Pacific Exposition in Seattle.

That the trophy may be the finest possible product of the silversmith's art, Mr. Guggenheim has offered a prize of $250 for the best design submitted.

He has extended to artists and designers generally an invitation to compete, and there are no restrictions. What Mr. Guggenheim wants is the most artistic design for the best trophy that $2,000 will buy. For the design selected he will pay in cash the sum specified.

All designs are to be submitted to Welford Beaton, care of the Alaska-Yukon-Pacific Exposition, Seattle. They must be in his hands by March 31st, and should be accompanied by return postage. The designs submitted will be passed upon by a committee, which will be appointed by the president of the exposition corporation, which committee will award the prize and assure the return of such designs as are accompanied by the necessary postage.

Ten Story Building.

Architect Fred H. Meyer has plans out for the new Kohler & Chase building to be built at O'Farrell street and Bagley Place, San Francisco. The building will have a heavy steel frame with concrete floors and walls, and a handsome terra cotta facing. The entire building will be occupied by Kohler & Chase, and one of the features will be a music hall on the second floor. This will be decorated in light tints and ornamental plaster and will have maple floors. The eighth and ninth floors will be divided into studios for music teachers, while the top floor will be arranged for the executive offices of the company. There will be two large elevators, a steam heating plant, vacuum cleaning, private telephone service, etc.

Book Review.

"Detached Dwellings" is the name of a valuable volume just published by the Swetland Company of New York. The book contains a collection of nearly one hundred illustrations, 9x12, each accompanied by floor plans. The collection differs from all others of a similar nature in that it represents the work of a large number of architects, who have made a specialty of detached houses and have achieved the greatest success in that line.

It represents houses that have actually been built throughout the country. In addition to the full page illustrations the publishers have shown in some instances, interiors, doorways, pen and ink sketches, etc. Coupled with it is an article by that eminent authority on the country house, Mr. Wilson Eyre, in which he brings out the important points to be considered in planning a home in order to obtain the comforts and pleasant surroundings, the desire of every home builder. This work should be invaluable to architects in getting the idea of clients.

The price, whether in portfolio or substantially bound in cloth, is $5.00.

Engineering Problems at Cement Show.

Some trying engineering problems were encountered in the installation of the exhibits at the recent cement show in Chicago. A solid reinforced white concrete column more than forty feet high and weighing twenty-five tons had to be planted firmly on a space of floor that would be strong enough to hold it. To get the "monolith" in place, the services of 350 men were required. The column is ornamented with base relief panels and statuary effects. It is an exemplification of the use of cement of a special white type for statuary. It required the direction of engineers and the work of the small army five hours to install the affair.

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CONTRACTOR ENGSTRUM VINDICATED

Contractor F. O. Engstrum and State Engineer Nat Ellery have come out victorious in the charges of faulty concrete construction on the new hospital buildings at Agnew, Cal., preferred by the State Building Trades Council. The Architect and Engineer has no fight on with the State Building Trades Council nor is it disposed to applaud Mr. Engstrum because he is an "open shop" man. There are some very commendable features about a trades union that deserve support. On the other hand there are some things about a union that are extremely unsatisfactory. In the charges against Contractor Engstrum we have a striking example. The case from the beginning looked to us like a piece of spite work.

Engstrum fought the unions in Los Angeles for years. It cost him a pretty penny but he won out. At first he was willing to employ a union man but he reserved the right to pay the man what he, Engstrum, thought he earned. He did not care to pay a $3 a day man $5, so he declared for an "open shop" and in spite of the bitter and costly fight that was waged, Engstrum made money. Soon after the earthquake he determined to reach out for some of the work about to be commenced upon city and state buildings in Northern and Central California. At San Jose the city was going to put up a $200,000 high school. The Garden City is a well organized union town. "Better not go there or they'll do you," Engstrum was warned by a dozen different persons. The contractor shrugged his shoulders defiantly. The plans for the high school, photographs of which are shown in this issue of the Architect and Engineer, called for a building of reinforced concrete. That meant practically a fire-proof building. Engstrum put in his bid. When it came time for awarding the contract it was rumored that Engstrum had underbid his next lowest competitor by $40,000. Did he get the contract? No. The school trustees, influenced no doubt by their labor friends, decided to reject all the bids and ordered the plans revised. Later the contract was let to a San Jose union contractor on practically the same bid as Mr. Engstrum's. But the San Jose contractor had figured on a semi-fire-proof building, not a reinforced concrete building like Engstrum had agreed to put up.

When bids for the State buildings at Agnew were called for Engstrum was much in evidence. He had the equipment and organization which enabled him to bid low and he got one contract after another. The unions had received their first set back. Then, as construction of the buildings progressed, came the charges of the State Council—charges of faulty construction and inferior workmanship that astounded the State. The Governor ordered an immediate inquiry. Physical tests of the strength of concrete beams, girders and walls were made. Tons of material were piled on the floors, experts were employed by both sides to institute minute examinations. But the walls failed to collapse under the heavy stress and the floors and beams remained intact. The contractor was vindicated. The union's attempt to "break" Mr. Engstrum once more had failed.

WANT COAST LEAGUE OF ARCHITECTURE

The Portland Architectural Club, in its efforts to form a Coast League of Architecture, deserves the support of every architect on the Pacific Coast. The movement is prompted by a desire to simplify a circuit of architectural exhibitions to be held during the year in each of the large Coast cities. At these exhibitions it is proposed to show the work of prominent Eastern architects, the purpose being to get better acquainted with the class of work being turned out by the Eastern members of the profession and permit a comparison with our home product. Mr. E. F. Lawrence, an indefatigable worker in the movement, summarizes the purpose of the club very well in these words:

"This is in no way an insurgent movement. We want to hold these exhibitions so we can inspect examples of the best Eastern work and we want to intelligently discuss the problems which we are facing in this section of the country. To do this with any degree of success we must have the co-operation of the San Francisco and Los Angeles architects as well as those of Seattle and other Pacific Coast cities. While the movement originated in Portland the benefits to be derived will be quite as helpful to the architects of one city as another."

CEMENT FOR HIGHWAY USES

Hardly a week passes but we hear of some new use for concrete. Not only are we building houses of concrete, but we are using cement for railroad ties, sidewalks, curbs, gutters, bridges, street paving, sewer and water pipes, refrigerators, fences, etc. Concrete for highways bids fair to become popular, especially where an extra hard surface is desired for heavy traffic. Cobble stones and granite paving have been used heretofore but it is claimed that concrete is superior to either. Concrete or artificial stone can be laid for less money while its lasting qualities are too well known to need further comment. Concrete men say it is only a question of time when road builders will use Portland cement with the same confidence and eagerness that they now use asphaltum, granite and brick.

Olympic Club Competition

The San Francisco Olympic Club competition will close March 30th, and soon after that date it is expected the committee will announce the name of the successful competitor. The building will be a handsome one and no time will be lost in erecting it, upon approval of the plans. About a dozen San Francisco architects are participating in the contest.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

Indirect Illumination.

By Augustus D. Curtis.

INDIRECT illumination is acknowledged by all who make a study of artificial interior illumination as the most aesthetic and modern method. This form of illumination having the light source concealed and usually depending upon reflection from ceiling, walls or other reflecting sources for an even illumination of the room, has been limited in its practical application, owing to the great loss or absorption of light after leaving its original source before it reaches the working plane.

Various attempts have been made to solve the problem, and there are a considerable number of installations in which indirect illumination is applied in different ways, the most successful heretofore being that in which the light is hidden behind brackets or cornices around the edge of, and the light reflected toward the ceiling of the room. Another method which produces very pleasing effects is that in which the light is reflected through art glass in the ceilings of the room. Either of these methods produce very pleasing results, and wherever expense is not to be considered these methods will undoubtedly grow more and more in favor.

Recent developments have made commercially available, that is, bringing within the reach of the person of ordinary means, this method of system of indirect illumination. Valuable suggestions by members of the Illuminating Engineering Society were followed out, as also those by members of the Ophthalmological Society, who are so emphatic in the assertion that most eye troubles are caused by the present method of artificial illumination in which the delicate mechanisms and nerves of the eye are subject to the direct rays of the intensely brilliant modern lighting units.

The successful solving of this problem and its practical working out depended upon two things:

First: a light of high candle power at low cost.

Second: a reflecting surface that would give the first reflection of light upward without material loss. Where gas is used the necessary candle power and economy is found in using the higher grade incandescent mantle burners. Where electricity is used, the high efficiency of the Tungsten lamp proves an ideal source of light for this indirect lighting system. The intrinsic brilliancy of this lamp makes inadvisable its use in small rooms on ordinary chandeliers because of the blinding effect.

The design or shape of the reflector has an important bearing on the efficiency and on the effect produced in the room. The correct shape of reflector for throwing the rays of light to the ceiling without shadows, as adopted, has been the result of considerable calculation and experiment. The perfected design is of bell shape and contains peculiar circular and vertical corrugations.

Being fire glazed, the exposed glass surface is easily cleaned with a soft cloth.

The indirect lighting units worked out consists of this scientifically correct bell-shaped corrugated reflector fitting in a spun brass casing. On gas fixtures this spun brass spinning rests on the base of the mantle like a globe. On electric fixtures this casing can either be suspended by chains or supported from below, as is the case of gas fixtures. It is evident that an infinite variety of ornamental designs can be worked out embodying these units. They can easily be installed on gas or electric chandeliers already in use. Unless the chandelier arms are very heavy, it can be applied on any electric chandelier where the sockets are pendant, as the arms do not cast annoying shadows on the ceiling, because the light comes from so many directions when passing the arms, due to the corrugations.

The lighting units should be at or near the center of the room, though side lights can and have been used with satisfactory results. Light colored walls are not essential, as most of the light is directed to the ceiling.

Indirect illumination is not only more aesthetic, but enables one to see better. While it is true that there is a loss of light, another factor enters to overbalance this. The more easily details can be seen the more effective is the illumination. When there is a bright naked lamp in front of the eye, the pupils contract and therefore the eye takes in less of the light, and the things that are illuminated are not seen as clearly as with less light with a wide-open pupil. Hence the fact that there may be less light with indirect illumination does not mean that we see less clearly, but on the contrary, we really see better. Many are of the opinion that we are suffering not from under illumination but from over illumination.

Of course, this system of illumination is not as practical with beamed ceilings or those of dark tint, but in the majority of instances we find the ceilings light

and the conditions favorable. There are at present many experimental installations of this system in use among professional and business men in their residences and offices. Without exception, they are enthusiastic in its praise, and are so impressed with the eye-comfort derived from its use that they would go back to the old system of lighting only under protest.

These units can, of course, be arranged in a variety of ways. The fixtures can be installed in single units or multiples thereof, either electric, gas, or combinations of both, and it is practical to illuminate in this way, not only in residences, but halls and auditoriums. A unit of one reflector and one 100-watt Tungsten lamp (about ½ watt per square foot), or a good gas mantle burner (consuming about 4½ cubic feet per hour) gives a beautiful illumination in a room up to 15 feet square. This consumption makes the cost very reasonable, being at the average cost of gas or electric current of from ½ to 1 cent per hour. This is probably not more than it costs in the majority of instances to illuminate such rooms now. The cost of installation and maintenance does not, we believe, exceed that of the ordinary methods now in vogue.

Architects and Lights.

MISS LOIE FULLER created for herself an international and lasting reputation by utilizing the possibilities of colored light in connection with what has been termed "poetry of motion," otherwise the dance. While most of the stage dancing is more properly the doggerel or parody of motion than actual poetry, the definition applies with peculiar aptness to the creative and original work of Miss Fuller. She has lately been writing her memoirs for the New York Herald, which are both instructive and entertaining. Anyone who has sufficient original genius to create a new departure in an old art which will attract the attention of the world is worth listening to. Among her various experiences and opinions, she makes the following very significant comments as to the relation of architecture to illuminating engineering:

"At the time of my arrival in Europe I had never seen a museum. The life I led in America gave me no opportunity to admire art. The first gallery I visited was the British Museum, in London. Then I wandered through the National Gallery. Later I studied the works in the Louvre, and at succeeding times had an opportunity to see most of the galleries in Europe.

"Aside from the masterpieces gathered together in those buildings what struck me most in all the museums I went through was that their architects had paid no attention to light effects. In consequence of that defect every one of them impressed me as an incongruous combination. When my eyes fall on objects and I look at them for a few moments my vision becomes dimmed and I find it impossible to separate one object from another. I have often wondered whether some day this whole question of light will be better understood.

"Illumination, reflections, the rays of the sun falling on objects are such essential problems that I cannot understand why so little importance is given to them. I have nowhere seen a museum where the lighting scheme was perfect. The panes through which the light enters and the lamps which illuminate the different halls ought to be hidden or shaded, so that the objects in them may be contemplated without the eyes being molested by the glare.

"It should be the aim of architects to diffuse light. There are a thousand ways of doing this. In order that light should give the best results it ought to be focused directly on the pictures and statues, instead of striking them by chance.

"Color is decomposed light. The rays are broken up by molecular vibrations on touching any object. This decomposition of which a photograph is im-

printed on the retina is always the result of various chemical changes in the matter itself and in the rays of light. Each of these effects is designated by the name of color.

"Our knowledge of the production and variation of these effects is exactly in the same stage where music was—when there was no music."

New Manager for Enos Company

Carl E. Roesch, one of the associate editors of The Architect and Engineer, and for the past four years assistant to J. C. English, Pacific Coast manager for the Enos Company, manufacturers of high class lighting fixtures, succeeds Mr. English, the latter having gone into the fixture business for himself in Portland, Ore. Mr. Roesch has the well wishes of a multitude of clients and friends not only in San Francisco but throughout the Pacific Coast. The Western office of the Enos Company has made remarkable progress during the past half dozen years, a fact that in a large measure is attributable to good management. The superior class of fixtures carried by the Enos Company has naturally had much to do in building up a highly successful business.

Prior to coming to the Pacific Coast, Mr. Roesch was a student of Willy Lau, of Chicago, than whom there is no more distinguished designer of lighting fixtures in the Middle West. The valuable experience enjoyed while in the employ of Mr. Lau, together with the four years' training while associated with Mr. English in San Francisco, has made Mr. Roesch eminently fitted for the important and responsible position which he has just assumed. Mr. Roesch is a prominent member of the San Francisco Architectural Club, the Press Club, and the Corinthian Yacht Club. The Enos Company, as in the past, will continue to specialize in residence work, and careful attention will be given orders, not only in San Francisco but in every city and town on the Pacific Coast. A notable installation just being finished by the Enos Company is the lighting fixtures in Senator George Nixon's new residence at Reno, Nev.

Plumbing Alterations.

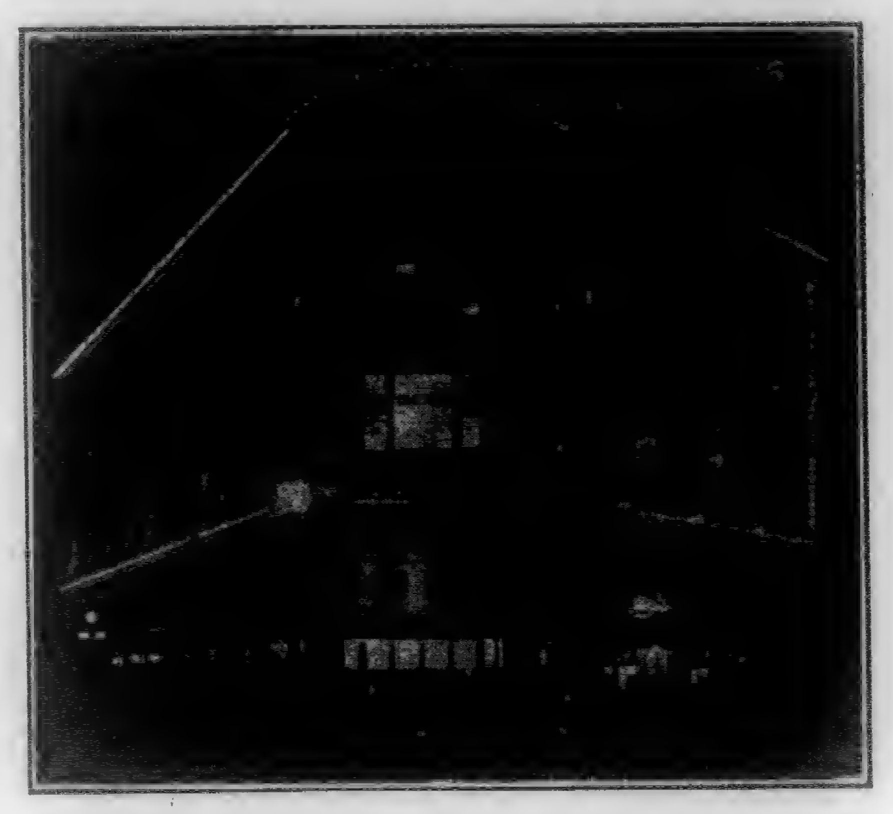
In making extensive plumbing alterations it is wise to have a comprehensive plan prepared before letting the contract. The advantages of having well prepared plumbing plans and specifications are seven-fold, says a competent engineer on this subject. There are many men of financial responsibility engaged in the plumbing business who do not posess sufficient skill and knowledge to properly lay out a system, and, unless the plans are full and complete and the specifications explicit, these men cannot intelligently estimate on the work; consequently, they will either re-

fuse to figure the cost or will estimate so high as to be out of contest. If, on the other hand the plans and specifications are so well prepared that nothing is left to conjecture which can be shown, described or explained, the architect and owner will have the benefit of responsible competition and will secure a better installation.

Night Illuminations.

By E. W. Pike.

WITH the Mardi Gras feeling that San Francisco is trying to arouse in its citizens it would be well for architects, owners and merchants to put their shoulders to the wheel and help to convert San Francisco into a Carnival City. What looks better to a stranger coming into town than well lighted buildings and streets? Particular attention should be paid to outside illumination of buildings and promenades. The Downtown Improvement Association has made a start, and it should be kept up. The arches on Fillmore street are the principal reason of the night life on that thoroughfare. Plenty of light gives the appearance of prosperity, and a successful appearance attracts trade. The photograph shows a



night picture of the store of Roos Bros., Stockton and Market streets.

Modern Methods of Lavatory Plumbing.

"LAVATORIES, or wash basins for the face and hands, have become a necessary plumbing attachment of the modern home, says "Shoppell's Magazine." As a rule round basins are used, but the oval pattern is becoming

more and more popular. This latter pattern allows more elbow room and also a larger opening, thus lessening the splashing of water over the slab or floor. Three kinds of marble are used in setting lavatories. The kind known to the trade as American is soft and white and easily stained, while it absorbs greasy matter readily. The Italian marble is hard, veined and white, will take a fine polish but stains, though not so readily as the American marble. The marble known as Tennessee stone is very hard, procurable in dark colors only, and very desirable for lavatories on account of its small liability to stain or absorb greasy or oil matter.

The basin of the lavatory should be set up open, on brackets or legs, and all pipes should be exposed. This method will allow leaks to be readily detected, will promote cleanliness and ventilation and ensure better workmanship by the plumber. The basin should be set 28 to 30 inches from the floor to the top of the marble and provided with a back, or spatter protector, 12 to 16 inches high and extended the length of the top. Bevelled or O. G. edges make a desirable finish, although a roll-rim effect, to compare with the bath tub, is now much in favor.

In attaching a basin to a slab three or four holes are drilled on the under side and a special screw with expanding head is inserted. This screw is provided with a clamp and nut, and after wetting and spreading evenly plaster or cement, the nuts are tightened and the basin is firmly attached and suspended when in its proper position. Plaster or cement is used in preference to putty or white lead because the oil in the latter would become absorbed and stain the marble through to its polished surface. Plaster, repeatedly wetted, will soon wash away, thus loosening the joint and allowing the splattered water to run between the slab and bowl and thence to the floor, which is very annoying. Cement, mixed with plaster, about half and half, is more desirable than plaster alone.

The edges or flanges of the earthenware basins are seldom perfectly true, being warped somewhat in baking. Therefore such flanges should be ground to a flat, level surface in order to make a satisfactory joint between the marble and the basin. The overflow is the weak point about a lavatory basin as usually installed. When the ordinary basin is discharged the waste backs into the overflow, fouling it and allowing the filth thus deposited to discharge its offensive odors into the room. A basin should be without mechanical parts in the waste pipe, either inside or outside the bowl, as they frequently get out of order and all fouling surface for the adhesion and accumulation of filth. No basin should be used which has concealed spaces with which the washing water can come in contact while being used. The siphon basin is now considered the most desirable form as its contents are discharged by siphonic action, and the trap will always be clearer, owing to the powerful flushing and scouring force caused by the rapid discharge. By lifting the plug and immediately dropping it back into place the water is forced to rush out through the overflow that connects with the waste pipe below the plug.

If by accident or design faucets are left open the water, after attaining its proper level, finds free access through the outlet, and, if the overflow continues, a siphonic action is produced, thus causing a rapid discharge of the bowl contents and preventing an overflow. The siphonic action prevents the clogging of the waste, as it clears out matter such as hair, lint, etc., with its thorough scour. Basin cocks of various patterns are on the market and they can be procured as ornamental or expensive as may be desired.

The outlet of a basin should be at least 1¼ inches in diameter, although nearly all manufacturers make them smaller unless orders are given to the contrary. The waste pipe and trap should be not less than the outlet in diameter. With the combined slab and basin in one piece of crockery, with standard of porcelain, with proper sized outlet, a very sanitary appliance is produced which should satisfy the most fastidious home owner.

Longest Bridge in the World.

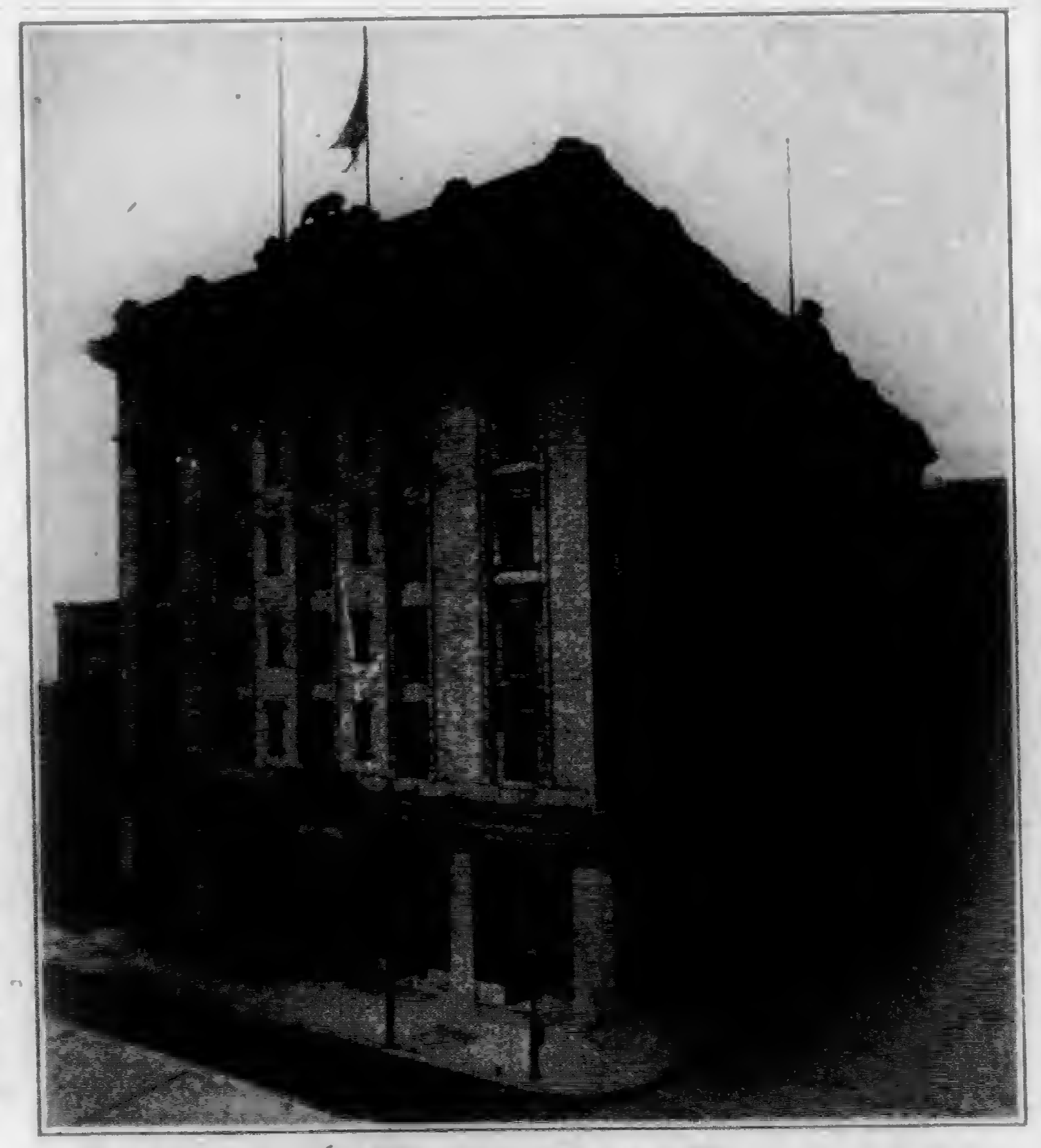
The longest bridge in the world crosses the Yellow Sea near Sangang, China. It is called the Lion bridge, and its length is five and a quarter miles. It is supported by 300 huge arches, is 70 feet above the water, and is enclosed in an iron network.

By the Way

Some Industrial Information Worth the While

Mr. Chubbuck Buys Out Mr. Harris

The firm of Chubbuck & Harris, San Francisco, has dissolved partnership, Mr. Chubbuck succeeding to the business. This firm began business about three years ago, prior to which time Mr. Chubbuck was connected with the Steiger Brick and Terra Cotta company. After the fire the concern was incorporated, and the offices were moved from the Atlas building to 710 Mission street, near Third. Chubbuck & Harris were among the first San Francisco business houses to get located again after being burned out in the big fire. Less than two months after the conflagration they were filling orders. Mr. Chubbuck is popular with the architects and building trade and his many friends wish him all the success he deserves. The old firm name will be retained. The same line of goods heretofore handled, including lime, cement, hold-tite plaster, etc., will be carried in addition to hydrate lime, a complete plant for the manufacture of which recently has been erected.



HOTEL ARGONAUT.—Righetti and Kuhl, Architects

Machinery and Electrical Company Busy

The Machinery & Electrical Company, 351-353 N. Main street, Los Angeles, has recently closed a contract for installing a heating and ventilating plant in the Covina High school, F. S. Allen, 712 Security building, Los Angeles, architect.

The plant consists of Sturtevant blowers, hermetic wrought steel furnaces and national thermostats. The school will be a model building and will cost $50,000.

The Machinery & Electrical Company also closed contracts for the heating and ventilating plants of the Lugonia school of Redlands, Cal., F. T. Harris, architect, which building will be equipped with hermetic furnaces. A similar equipment has also been contracted for in the Lowell building, at Redlands.

The Machinery & Electrical Company has signed contracts for heating and ventilating the Tempe-Union high school at Tempe, Arizona, the contract calling for Scotch marine boilers, Sturtevant coils, Sturtevant blowers and the national thermostats.

The same company has completed the heating and ventilating plants in two buildings for the Calumet & Arizona Copper Company, at Bisbee, Arizona. This work consists of installing hermetic furnaces and Sturtevant blowers in the general office building and the residence of Mr. Powell, manager of the company.

Plants are being completed in the Mesa grammar school building and the Valley bank building at Phoenix, Arizona and a department store building at Mesa, Arizona.

Chutes for Warehouses

The fame of the Haslett Warehouse Company's chutes for wholesale houses, loft buildings and warehouses has reached the East, and the company is at present installing chutes in the warehouses of the New York Dock Company which operates more than one hundred warehouses along the waterfront in Brooklyn, N. Y. The Haslett Company has received many inquiries concerning the chutes from different points on the Pacific Coast, and the present year will probably see all the large warehouses in California and Oregon equipped with these money-saving and time-saving devices.





Makes High Grade Oil Burning Machinery

The use of fuel oil for feeding both power and heating plants is becoming more general as its superiority over the old methods becomes better known. Not only is fuel oil cheaper than coal and wood but it is much cleaner.

The use of oil for fuel has naturally made a demand for oil burning machinery for both low and high pressure plants, and probably no concern in San Francisco has a higher standing among the manufacturers of this class of machinery than the Dietert-Swenson Company, who have recently moved into new quarters at 80 Tehama street, near Second. This company makes only high grade appliances, and its references are first-class in every particular. They will be pleased to receive inquiries, and an application for their catlogue will be answered promptly, postage prepaid. Their telephone number is Douglas 4420.

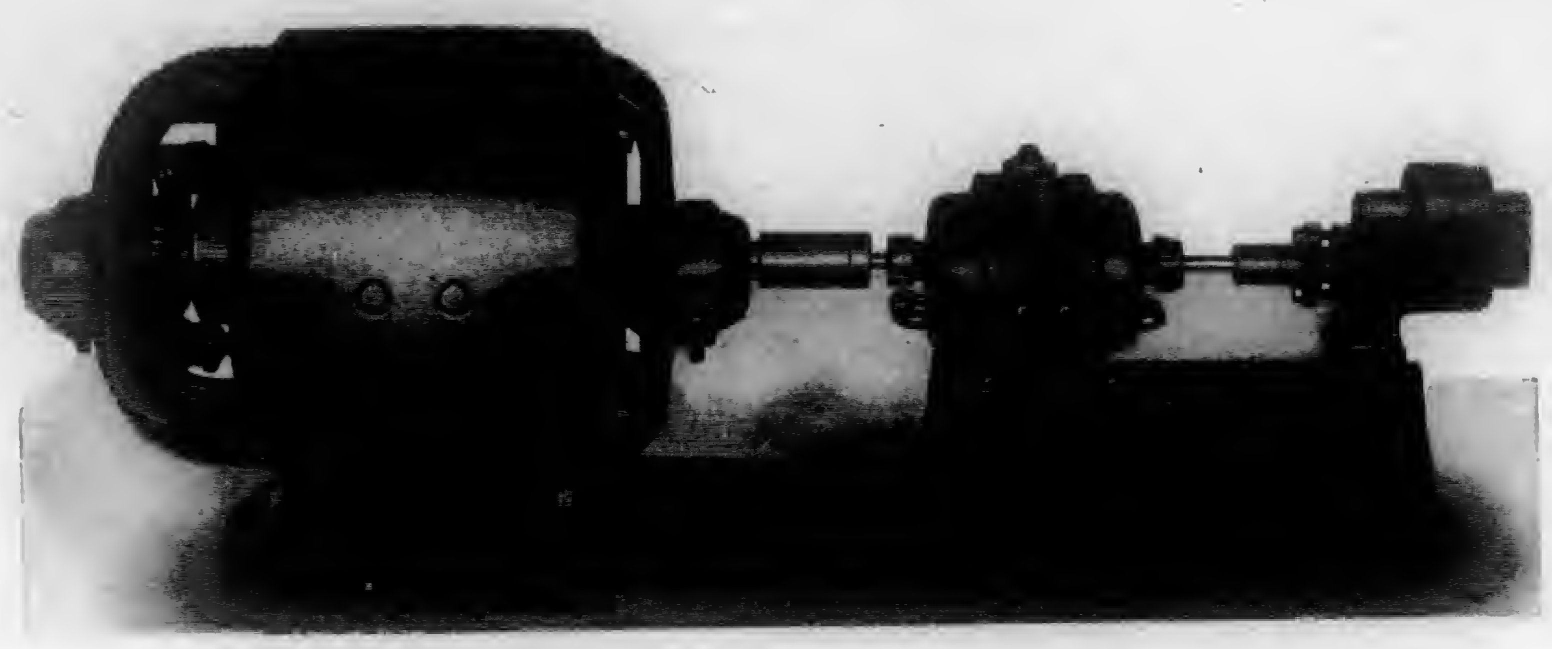
Audit Company Moves

The Crook Audit Company which has had offices in the Monadnock building has moved to the fifth floor of the Clunie building on California street, San Francisco.

To Install Gravel-Washing Machine.

The Kruttschnitt Building Material Company is planning to carry on a sand and crushed rock business on an extensive scale after the first of April. By that time Manager Wood expects to have in operation the only big gravel-washing machine on the Pacific Coast. Reinforced concrete contractors have long been wishing for the time to come when they could buy a first-class, well-cleaned gravel. When covered with mud and silt the pebbles are poor bonds for the cement. It is proposed to market the washed gravel at the same price as the unwashed material.

The Kruttschnitt Company has one of the best gravel and crushed rock plants in California, with a supply that is inexhaustible. The quarries are located near Niles, and recent reports of eminent chemists place Niles gravel at the top of all others, especially the Niles roofing gravel. The latter was used exclusively in roofing the new Phelan building in San Francisco.



Direct Driven Rotary Compressor and Oil Pump

An Improved Oil Burning Plant

The above cut is a good illustration of the G. E. Witt Company's direct driven rotary compressor and oil pump which is calculated to fill a long felt want for use in hotels, apartment houses and office buildings. It contains many features not possessed by other machines, among them being the absence of costly chains or sprockets to be replaced at great expense, also the absence of the worm gears which wear out very quickly. It is self contained, lasts much longer, costs 50 per cent less to maintain, requires twenty five per cent less oil for lubrication and requires no experienced operator. There is no noise or vibration. It has a low speed motor which has plenty of excess power and while the motor is more expensive it will last longer than a high speed motor.

The Witt company has recently moved to larger quarters at 850-852 Howard street, San Francisco where one of the finest plants for the manufacture of oil burning machinery on the Coast has been installed. The company has increased its working force materially and is now in position to fill orders promptly and satisfactorily. Within the past twelve months low pressure plants have been installed in the following buildings: In San Francisco, Hamlin hotel, Goodyear Rubber Company, Madison Burke Company, Taft Pennoyer Company, Cosmopolitan building, Gunst building (Third st.), Gunst building (Powell st.), Hotel Regent, Brilliant hotel, Carmelita apartments, Gustave Sutro building, Sherman Clay building, Callaghan building, Cornelia apartments, Home Telephone building, Bush and Fillmore streets, Koshland building, Cuneo Bros., Murphy Grant building, Mary S. Merrill building, Home Telephone building, Grant avenue, Armand-Cailleau building; Producers Bank building, Bakersfield; Fresno Republican Company's building, Fresno; Elks building, Stockton; Stockton bank, Stockton; Modesto courthouse, Modesto; Haverfy Company, Los Angeles, Gearhardt Oil Burner Company, Fresno.

Cornice Works Moves Office.

The Eagle Cornice Works have moved their offices to the Metropolis Bank building, San Francisco.

There's a Reason

Every reader of advertisements knows that there is a reason for Postum. That we are not told what the reason is does not gainsay the fact—for Postum sells.

There is a reason for the Lucitania breaking all records and we laud the achievement.

There is a reason for the Panama canal, wireless telegraphy, the Hudson terminal, and for every new and successful enterprise.

There is a reason, too, for the unprecedented sale of Trumbull panel boards.

The reason is that the manufacturers have given the trade something it wanted, at a price it could afford to pay, and of a quality and service better than it could obtain elsewhere at the same price.

Here are a few points to note on Trumbull panel boards:

First. The regular switches on Trumbull panels, although spaced for 10 amperes, are made of 30 ampere capacity stock and will cover 30 amp. specifications, if spaced accordingly. This is a noteworthy fact.

Second. All the hinge screws are spun over to prevent nuts from unscrewing, thus loosening contact.

Third. High, wide, knurled binding nuts are used, which allow for a 5/16" length of thread before the screw touches the slot. The reason for this specially long nut is because, in the low, short style of thumb nut, the burr which the slotting often leaves in the thread, binds against the threads of the screw and tends to loosen the screw in the base. The knurling of the nuts makes them easier to screw on and they do not show the effect of tightening by pliers.

Fourth. The fuse clips are of heavier bronze than is used on the great majority of clips. They contain no zinc and the spring will not deteriorate.

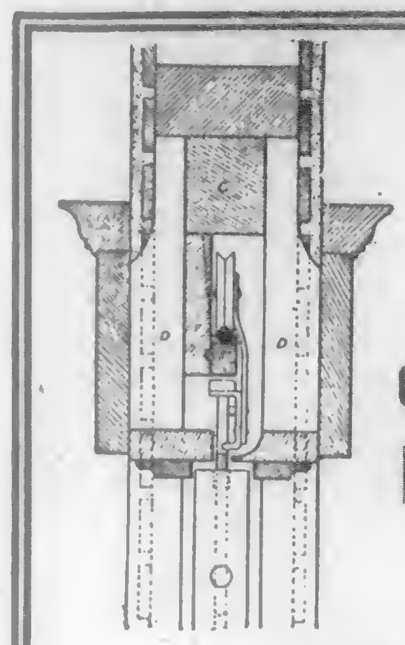
Fifth: The bottom of the fuse clips are grooved to fit the foot pieces and prevents them from turning on the connection.

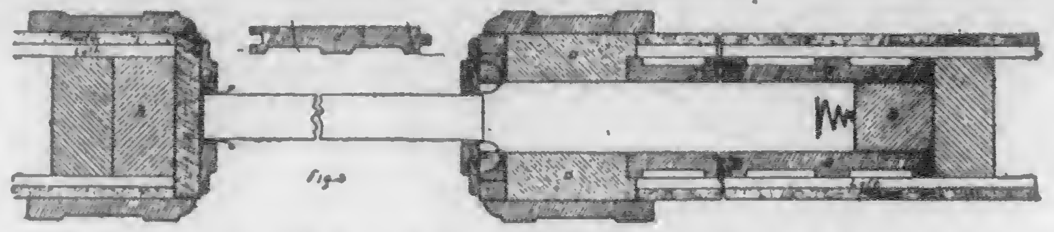
Sixth. Slotted bronze washers are used on the hinge posts, giving a stronger spring than those not slotted. Bronze screws are also used.

Seventh. Every joint between the bus bars and the outgoing terminals is individually tested by the lighting of a lamp, by current passing through.

Eighth. The grooves in each end of the spool handles fit the top of the blades and prevent the handles from turning, which turning will in time loosen the handle screws.

Trumbull panel boards and switches are handled by the Electric, Railway and Manufacturers' Supply Co., 84-86-88 Second street, San Francisco.





20 PER CENT SAVED IN SPACE

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List of locations given on application. Work fully guaranteed.

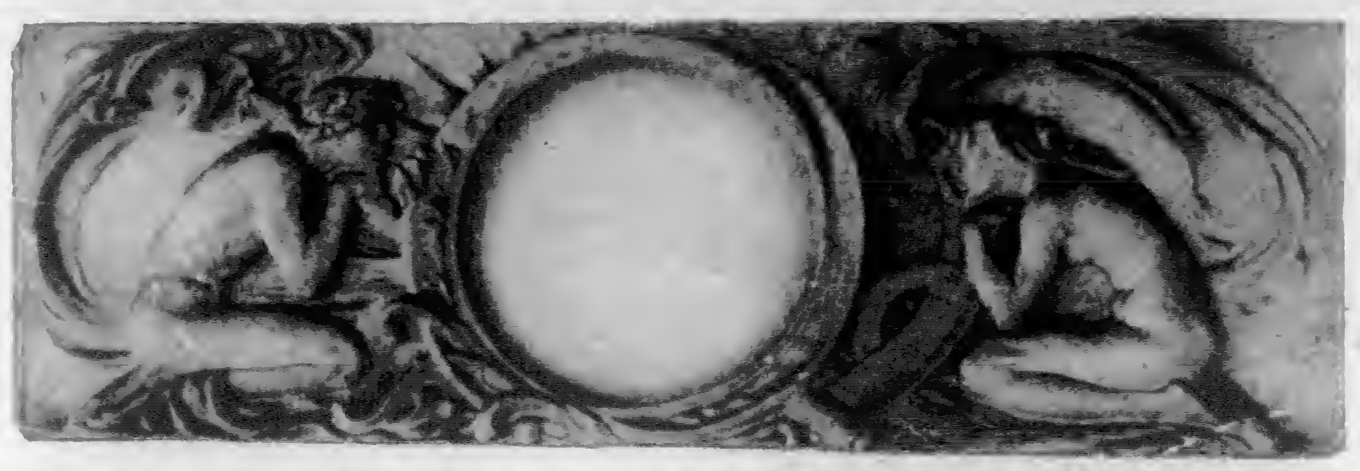
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Figures Executed in Ornamental Plaster in Bank of Italy Building, San Francisco. Shea & Lofquist, Architects

CALLAHAN & MANETTA

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Growing Popularity of Philippine Mahogany.

White Bros., of San Francisco, dealers in hardwood lumber and veneers, call attention to a large cargo of Philippine mahogany which they have just received by the steamship Dakotah from Manila. Heretofore only small lots of Philippine mahogany have been shipped here, as dealers have been loth to go very heavily into Philippine woods until their worth was proven. The Philippine product has shown itself to be so entirely satisfactory that White Bros. have decided it is the coming wood, and in consequence have laid in an exceptionally large stock.

Philippine mahogany posseses many points which give it an advantage over the Mexican and Central American woods. It comes in wide clear boards, running 12 to 24 feet long. In addition to this its price, which is almost half that of the Central American mahogany, and about the same as quartered oak, brings mahogany finish within the reach of many who could not afford it before shipments were begun from our island possessions. The first large job in San Francisco to be done in Philippine mahogany is the fixtures of the White House, Raphael Weil's new store, now being installed by A. J. Forbes & Son, of San Francisco. This material has been used in Portland and Seattle for some time and several large buildings in that section are finished with it.

The United States has now been in possession of the Phillippine Islands for over ten years, but it is only within the last few years that modern machinery has been installed and the manufacturers have been enabled to turn out first-class lumber at a price which would permit it being exported to the United States. The United States Forestry reports show that the hardwoods of this country and rapidly being cut out and it is only a question of a few years

An Index to the Advertisements

[Index continued on Page 108.]

when we must look to other countries for our supplies. Our island possessions furnish a virgin field for the exploitation of the lumber industry. The Philippine forests have lain dormant for thousands of years, but the ax of the American lumberman is now getting busv, and within a few short years we may expect a good part of our lumber supplies from the Philippines.

Fred Nichols in a New Role

The Newslet, published in East Oakland, has the following pleasant words for Fred Nichols, the well known manufacturer of fire-proof doors, etc.:

"Fred Nichols, the local manufacturer of metal covered doors, window frames, etc., has added the building of automobiles to his business. He has just sent to the paint shop a 60-horse power, six cylinder machine that is a beauty.

"He had it out for trial spins several days recently, and it worked to perfection, not one weak place developing. During the trials a speed of over 60 miles an hour was traveled over several straight pieces of road, and medium sized hills offered no obstruction to a speed of over 40 miles.

"Many enthusiastic motorists have examined the machine and pronounce it as one of the best seen on the roads in this section of the state.

"Mr. Nichols also has a 30-horse power machine nearly completed, and will continue to place machines upon the market as fast as he can find sales for the same."

Brevity

A newspaper man was thunderstruck on reading a telegram which ran:

"Twins this morning—more later. Sadie."

Nonpareil Corkboard.

Nonpareil Corkboard, the best of the three grades of cork insulation manufactured in sheet form by the Armstrong Cork Company's insulation department, whose head offices are at Pittsburgh, has not only the enviable distinction of being the only cold storage insulating material approved by the National Board of Fire Underwriters but has also had the seal of government approval set upon it, being used exclusively in insulating living quarters and refrigerated rooms aboard the vessels of the United States Navy. It was chosen by the government officials only after exhaustive tests, due regard being given its slow burning and fire retarding qualities.

The material consists of pure granulated cork slightly compressed and subjected to a patented baking process which insures permanency of form without destroying the cellular structure of the raw material. Although no foreign substance is added to serve as a binder the boards possess great structural strength and will not decay or disintegrate in the presence of moisture. In fact, the government specifications provide that the corkboard must stand boiling at atmospheric pressure for three hours without disintegration or linear expansion of more than 2% in any direction.

The fact that nonpareil corkboard will stand up under this severe test is indication enough of how durable it proves as an insulating agent. Its peculiar structure, consisting, as it does, of myriads of sealed air cells, impervious to air and moisture, accounts for its low heat conductivity and renders it, when properly installed, practically proof against progressive deterioration. The material has been used in almost two score of the larger battle ships and cruisers and is being installed now in the magazines of the battle ship "Iowa." In this case the naval authorities are experimenting with the use of refrigeration to hold down the temperature of the rooms containing high explosives and thus eliminate any danger of spontaneous ignition. Heretofore nonpareil corkboard has

ADVERTISERS' INDEX—Continued from Page 105

been used more especially on board ship to arrest the transmission of heat from boiler and engine rooms to living quarters. For general cold storage insulating purposes it has been installed in hundreds of cold storage plants, abattoirs, breweries, fur vaults, creameries, dairies, confectionery and baking plants, etc., throughout the country.

The Portland Architectural Club.

The stated monthly meeting of the Portland, Ore., Architectural Club was held Tuesday evening, March 2d, in the club rooms, with a full attendance.

Mr. Lawrence reported the results of his trip to the larger California cities. Many fine exhibits are on the way and a delegation of California architects will be in attendance.

Boxes, cases and bundles of matter for exhibition are piling up at the Art building and the exhibition committee are anxiously waiting for possession of the space that they may begin a classification and final arrangements.

A reception to the visitors from outside cities is planned, with banquets speeches and drives about the city.

The report of the Building Ordinance Committee was presented and the ordinance is now ready. If the City Council will refrain from tinkering with it, Portland will have the best building code of any city in the country.

Seven names of applicants for membership were presented and Mr. Vinson made his usual appeal to everybody to help boost the exhibition.

Portland Architectural Club

The Portland Architectural Club is completing its third year; its officers during that time having been:

Officers for 1906:

E. B. MacNaughton ....President
John G. Wilson ....Vice-President
H. A. Whitney ....Treasurer
C. H. Kable ....Secretary

Officers for 1907:

F. J. Berndt ....President
H. A. Whitney ....Vice-President
C. H. Kable ....Treasurer
F. T. Webber ....Secretary

Officers for 1908:

Jos. Jacobberger ....President
Edgar Lazarus ....Vice-President
John G. Wilson ....Treasurer
Ernst Kroner ....Secretary
A. E. Doyle ....
....Chairman Educational Committee
E. F. Lawrence ....
....Chairman Scholarship Committee

* * *

The Club has this year completed a very satisfactory scholarship work, and will show in connection with the coming architectural exhibit, the work of its members, besides that of the leading architectural scholars of the country.

* * *

The coming exhibition will have about 1,000 exhibits from such men as: Lawrence Buck, Earl Bitter, Frank Chotau Brown, Beil & Hermant, D. H. Burnham Co., Holabird & Roesch, Wilson Eyre, Benjamin Wistar Morris, Alley & Emery, A. H. Davenport, Jessie Arms, Jules Guerin, William Ittner, George Post Sons, John Calvin Stevens, Vernon Howe Bailey, Daniel French, Spencer & Powers, Pond & Pond, George Maher, Howard Shaw, Walter Griffin, Rutan & Russell, Claude Bragdon, J. Milton Dyer, and many others from the East.

* * *

The Western men from all of the Coast cities have sent large exhibits, and many of them are planning to attend the convention which is to be held at the opening of the exhibition on March 22nd.

* * *

A feature of the exhibition will be interior decoration and this department will occupy one whole gallery. Domestic work will fill the second gallery, scholarship work the third, while the larger and more ambitious projects will be grouped in the principal gallery. The exhibition will discharge on April 10th, and the committee welcomes anyone interested to notify them if a trip to Portland is possible.



Wrecking the City Hall, San Francisco
Photo taken during progress of work February 20, 1909

Wrecking San Francisco's Old City Hall.

THE work of demolishing what remains of San Francisco's City Hall, which has been an eyesore to the community since the great fire nearly three years ago, is going ahead satisfactorily under the competent supervision of the William H. Abbitt Construction Company. The wrecking operations are being watched with considerable interest, as certain features of the work are hazardous in the extreme. Mr. Abbitt is personally overseeing the work, and he has his hands full, giving orders to the sixty or more members of the wrecking crew. The crumbled stone, brick and plaster walls are first torn away, leaving bare the massive steel skeleton. The iron beams and girders are then taken down piece by piece, just as they were put up.

That part of the building which contains the big rotunda is fast disappearing, as is also the McAllister-street wing. The Abbitt Company agreed to tear down the rotunda for $7900, while their bid for demolishing the McAllister-street wing was $4900. All material taken from both jobs becomes the property of the contractors, except the marble, which is

to be stored in the corporation yards. It is estimated there are between 1800 and 2000 tons of steel in the building, all of which can be sold at a fair price. The several million brick can also be disposed of as second-class material. The famous statue which has crowned the great dome, and which was uninjured by the fire or earthquake, also becomes the property of the Abbitt Company and may be disposed of to some historical society. The Abbitt Company has six months to complete the work.

Mangrum & Otter, Incorporated, Have Successful Year.

The past year has been a most successful one for the well known firm of Mangrum & Otter, Inc., San Francisco, who occupy the entire four-story and basement building at 561-563 Mission street, with warehouses for reserve stock on railroad tracks, extending from Minnesota to Mariposa streets.

Mangrum & Otter, Inc., are large wholesalers of stoves, ranges, refrigerators, tin and enameled ware, and everything pertaining to the household furnishing line. They are also large contractors for tiling (both floor and wall), manufacturers of wood mantels, gas and coal grates, hotel and steamship kitchen equipments, as well as heating and ventilating apparatus for steam, hot water and warm air.

Notable among the buildings for which they have furnished tiling are the following: Palace Hotel, St. Francis Hotel, Stewart Hotel, Balboa building, Schiedemann building, Foxcroft building, Schroth building, Stanford Hotel, Southern Pacific Hospital, J. D. Grant residence and Whitney building.

Heating and ventilating apparatus have been installed in the Palace Hotel, Murphy Grant building, Postal Telegraph building, Pacific Hardware & Steel Company, Coffin-Redington Company, Luning building, W. W. Younger, Home Telephone buildings, Acheson and Bohannon buildings of Berkeley and the court house of San Rafael.

Complete kitchen outfits have been supplied in the St. Francis Hotel, Stewart, Argonaut, Victoria and Normandie hotels, The Emporium, Grover Cafe, Russell Cafe, Key Route Inn and Merritt Hospital of Oakland, Vendome Hotel of San Jose, Hotel Del Monte of Monterey, Santa Cruz Casino and Tavern at Mt. Tamalpais, and they are at present manufacturing the entire kitchen equipment for the new Palace Hotel, which will be, without question, the finest and most up-to-date in the country. This concern is well equipped in every particular, employing skilled men in each department, and any one needing anything in their line can be assured of receiving fair and courteous treatment.

American Encaustic Tiling Company, Ltd.

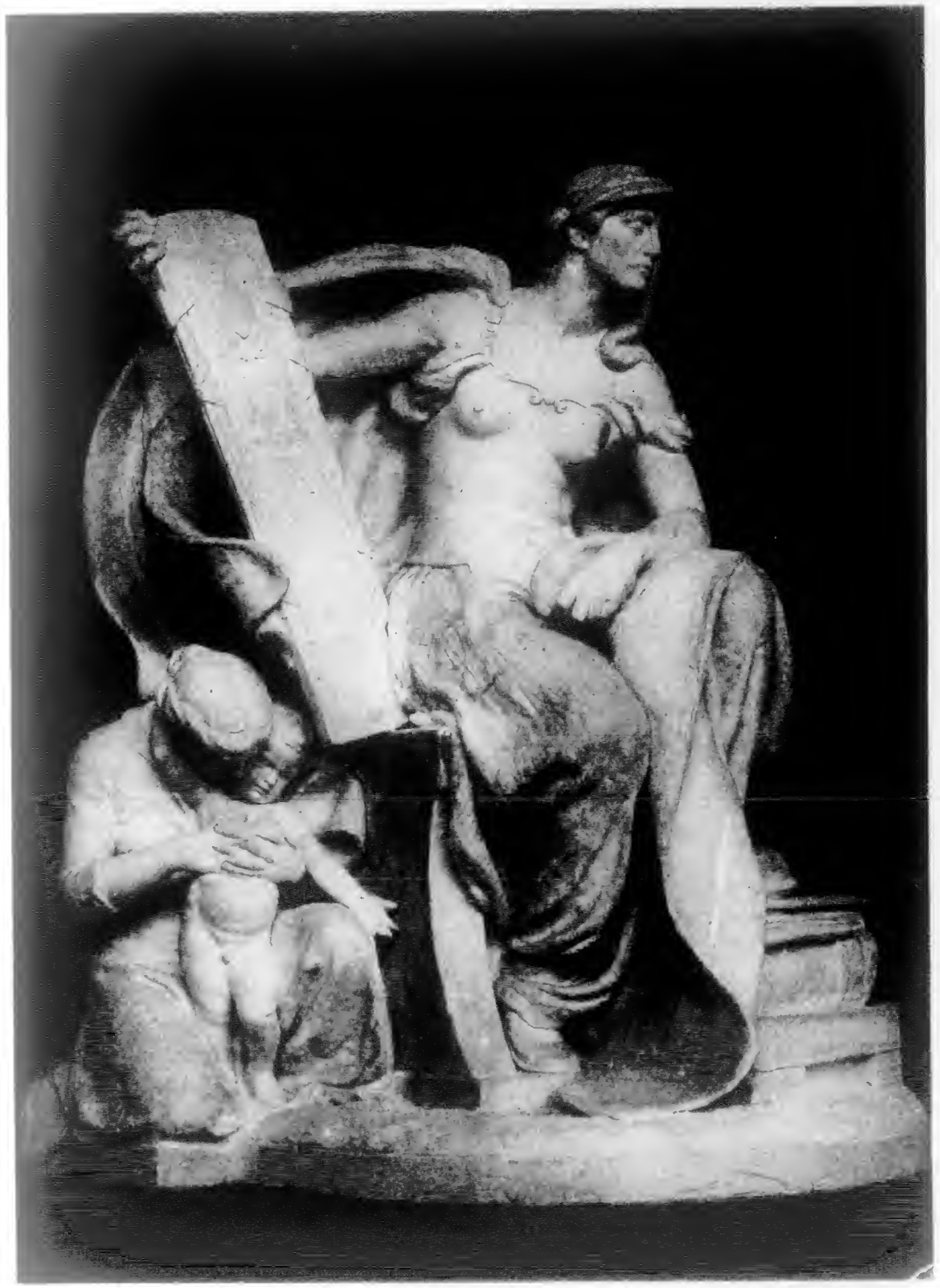
The American Encaustic Tiling Company, Ltd., is putting a new line of improved wall tiles on the market that will be known in the future as "Aetco" tiles. They are made under a newly discovered process and are superior in every way to anything heretofore made in this country or abroad. We are advised that there will be no extra price charged for this new line of tiles, and in anticipation of an increased demand and use of this class of tiles, the company has increased its facilities to take care of any amount of business that is likely to develop. The adoption of a standard grade of tiles to be known in the future as "Aetco" tiles, is a great protection to consumers, as it prevents unscrupulous dealers from contracting to supply one class of tiles and actually using an inferior quality. The products of this concern are something Americans can generally be proud of, as its products go to all parts of the earth where tiles are used and command the highest prices.

The Architect and Engineer of California Pacific Coast States

Terms of Subscription, $1.50 per Year — Single Copies, 25 Cents

Issued monthly in the interests of Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast.

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VOL. XVI. APRIL, 1909. No. 3.



Evening

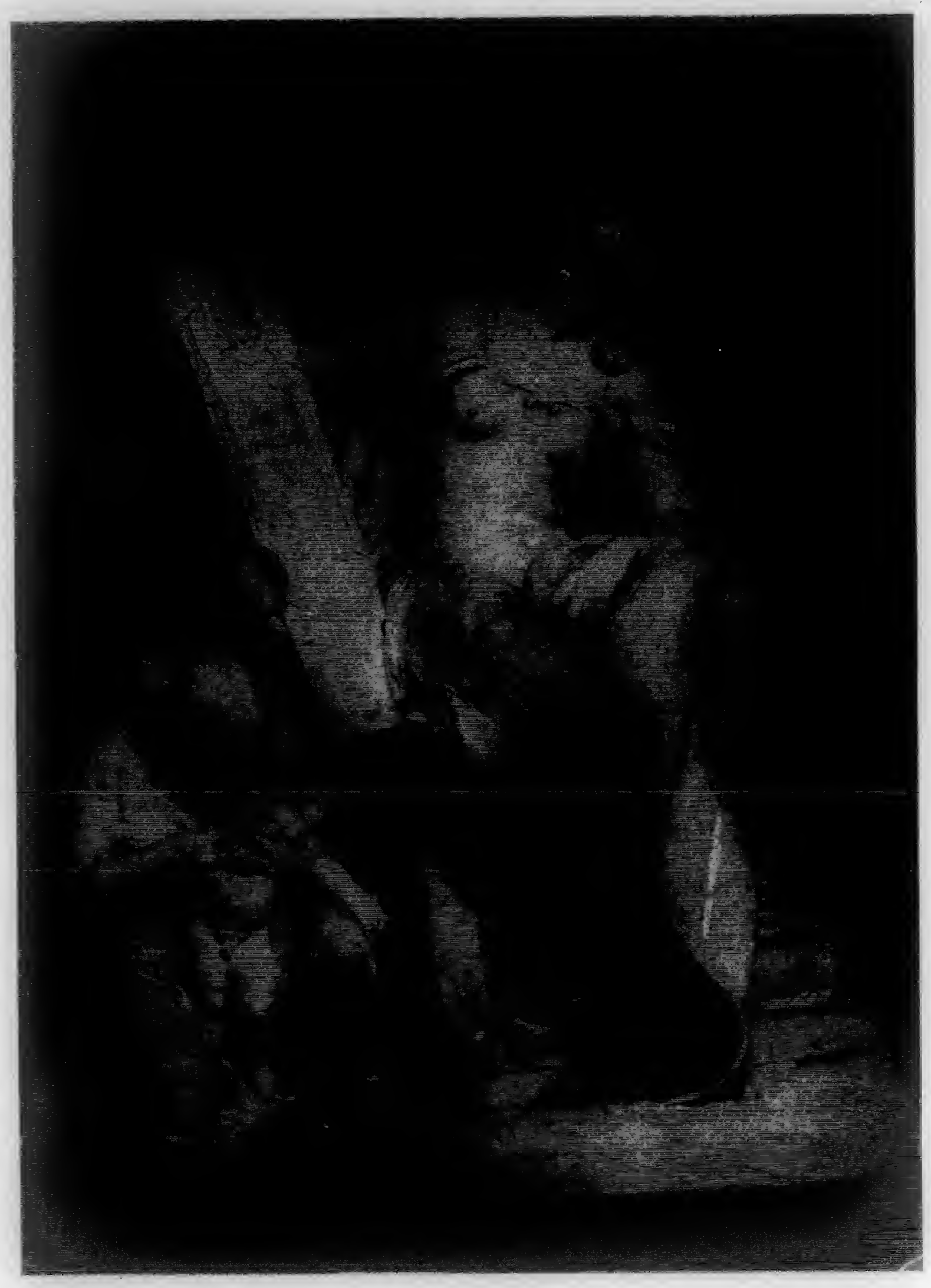
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By WILLIS POLK, President.

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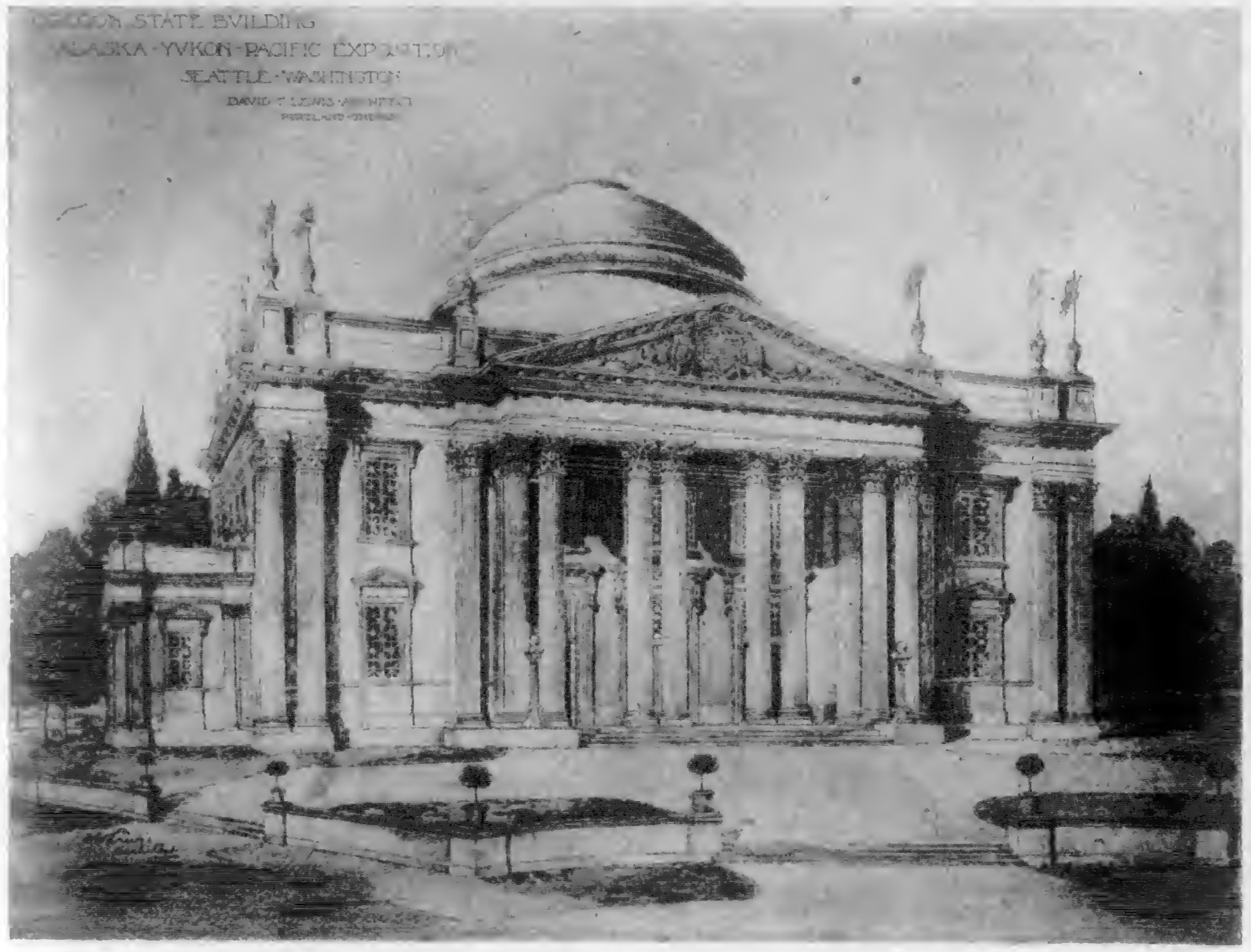
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Sketch by Lawrence Buck, Chicago, Ill.

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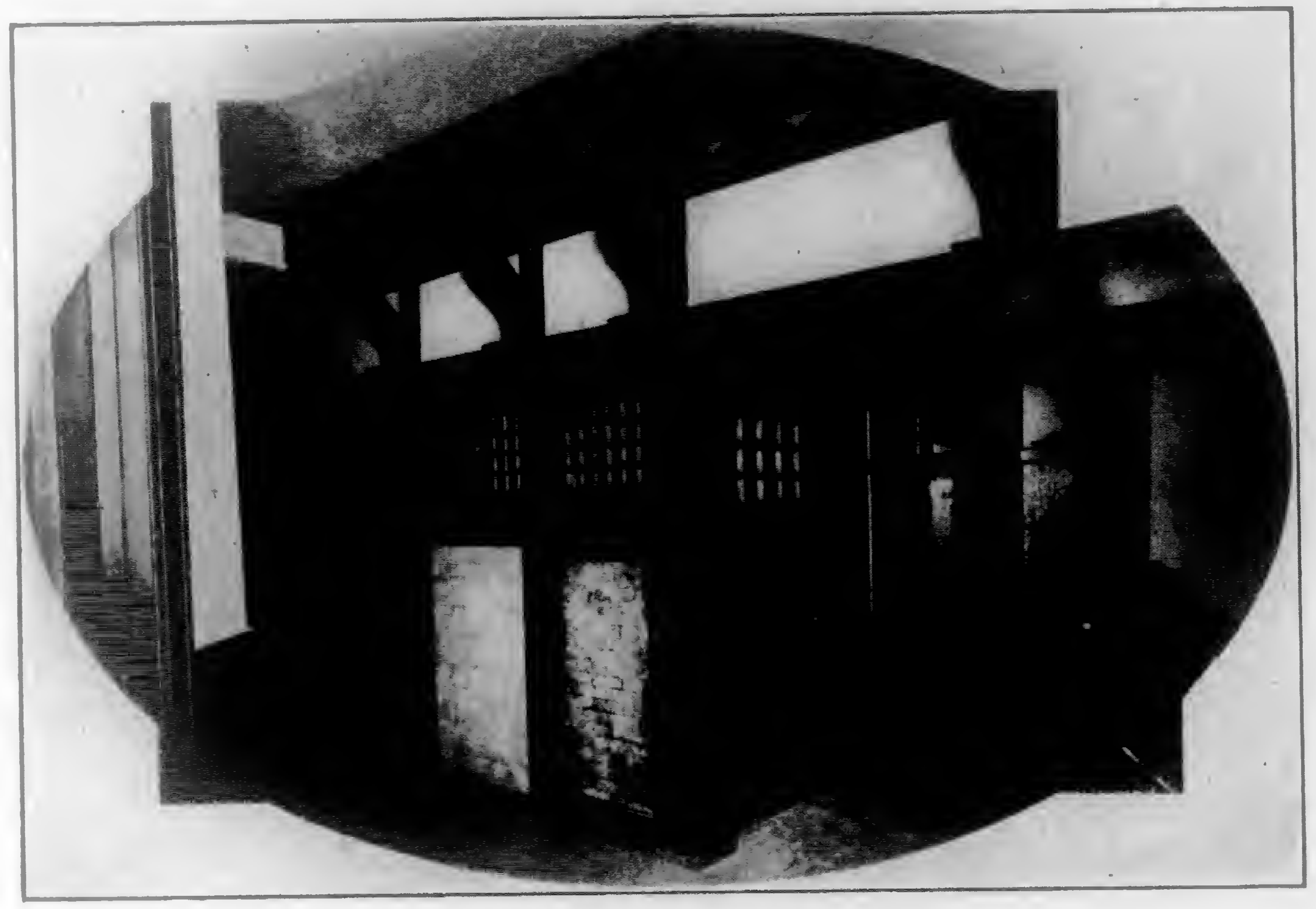
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Entrance to Office of Francis J. Berndt, Portland, Or.

Want Next Convention of the A. I. A. in California

Architect Willis Polk, president of the newly organized Architectural League of the Pacific Coast, has written the following letter to Mr. Cass Gilbert, president of the American Institute of Architects, inviting the Institute to hold its next or some future convention in San Francisco:

April 2, 1909.

Cass Gilbert, Esq., President of the American Institute of Architects, New York City, N. Y.

Dear Sir:

San Francisco, owing to its reconstruction, ought to be one of the most interesting cities in this country in which an annual convention of the American Institute of Architects could be held.

Doubtless the place for this year's convention has already been selected, but if it is possible that the convention of 1910 or 1911 could be held in this city, the Architectural League of the Pacific Coast will undertake to defray the expenses of all duly accredited delegates.

In connection with such convention, we would undertake to arrange an exhibition of architectural drawings, all expenses of such exhibition to be borne by us.

Trusting you will be able to give this matter an answer at as early a date as possible, I am Very truly yours,

WILLIS POLK,
President of the Architectural League of the Pacific Coast.

* * *

"I'm troubled a great deal with headaches in the morning," said Luschman. "Perhaps it's my eyes; do you think I need stronger glasses?" "No," replied Dr. Wise, meaningly, "what you need is not stronger glasses, but fewer."—Catholic Standard and Times.

The Law Element in the Practice of Architecture*

By ROBERT MORGENEIER, Architect and Engineer

IN carrying on his practice the architect is at once forced to recognize the pre-eminence, and more or less complex features of the civil law which he encounters at every turn, immediately a new building project is entered upon. He finds that, in addition to the interests, privileges and liabilities of his client, there are thrust upon him a careful consideration of the actual or alleged rights, interests and privileges of a host of outsiders, finally including a considerable part of the community and the state in which he may be practicing, and that, of necessity, he must shape his course and regulate his activities to the end that he will yield full and unqualified obedience to the laws regulating, defining and upholding inviolate all these various interests, etc.

Fortunately for the beginner there have been evolved in the practice a considerable number of "forms" embracing general conditions, specifications, notices, contracts, etc., which can in a measure be depended upon or used as guides in the legal and proper development, continuation and completion of each particular case: yet, when preparing building specifications or other documents by copying old forms or re-writing them, they are liable to "misfits," leading to later confusion, misunderstandings and ofttimes to litigation. If the practitioner would avoid these snares and pitfalls he must of necessity become master of the law element in his practice, to the end that it may appear clearly, concisely and effectively in his written work and serve as his ready guide when directing, ordering or concluding any matter of consequence. In brief, he must become a specialist in the law of construction, particularly in so far as it relates to buildings, viz.: "structures consisting of vertical walls covered by a roof and to be occupied by man."

In order to arrive at this, one must have a fair rudimentary knowledge of the entire subject, such as may be obtained at the technical schools, or by actual study and observation in an architect's office. Actual office practice tends to clear up involved facts, enabling one to form valid terms and descriptions which fit the subject matter.

In intimate connection with office FACTS must be carried on a course of textbook and special reading, and it may be well to say that such reading is profitable even to an experienced practitioner; also it can be said that the books and particular publications covering the subject are reasonable in number and the task therefore a comparatively easy one. For beginners the following "office study list" is recommended:

Wait's Engineering and Architectural Jurisprudence.

Wait's Law of Operations.

Building ordinances of principal cities. In California those of the cities of San Francisco, Oakland, Los Angeles, etc.

Drainage and sewer ordinances of same cities.

Statutes of California or other state in which practice is carried on.

Rules and regulations of National Board of Underwriters of gas, light, power and water companies.

Simultaneously with this course of reading, all "forms" in use should be studied and in practice remodeled, if such remodeling will improve them. The most important of these forms are:

1. Contract between owner and architects.
2. Contract with special engineer.

*Second of a series of papers on "The Law Regulating the Practice of Architecture."

3. Building specifications.
4. Building conditions.
5. Application for building permit.
6. Notice for bids from general contractors.
7. Notice for bids from craftsmen contractors.
8. Notice of opening of bids.
9. Notice to successful bidder.
10. Acceptance of bids.
11. Notice to owner and contractors to sign contracts, etc.
12. Bonds of contractor.
13. Bonds to city or individuals.
14. Building contracts.
15. Filing of contracts, etc.
16. Special orders—covering additions, changes, alterations, acceptance or rejection of workmanship or materials.
17. Notice forms to inspectors, etc.
18. Certifiacte to contractors.
19. Acceptance by owner.
20. Acceptance notice.
21. Certificate of examination of public records.
22. Notice of final payment.

Use of seal. Every preliminary sketch, plan, detail, specification, notice or certificate should be given under the seal of the architect.

The preceding is a general outline. Under the subject of forms, that covering contract between owner and architect is first on the list. My next communication will cover an analysis of such contract, and also present a practical legal form thereof.

* * *

World's Records in Speedy Workmanship

THE absolute record for bricklaying, says an exchange, is held by an American named Frank Stoehwahs, who in Chicago laid 162 bricks in two minutes and a half, using a trowel and putting in cross joints. It should, of course, be borne in mind that this was purely a piece of exhibition work, and all was made ready beforehand.

An extraordinary building feat of quite another character stands to the credit of Peter Vankirk, a master carpenter at Paterson, N. J. Talking to a wealthy brewer of the same town, Vankirk happened to mention that he expected to be in his new carpenter's shop by the end of the week. The other laughed.

"Why, you haven't begun it yet!" he jeered.

The upshot was a bet of $1,000 that the carpenter could not erect the shop in half a day. The building was to be 80 feet long, 50 feet wide, and two stories high. Vankirk got all ready beforehand, and employed all his men, 75 in number.

At one o'clock work started. The timbers sprang into their places as if by magic. By four o'clock the sides and roof were finished, and at half-past five the building was completed and ready for occupancy. The whole thing had been completed in 270 minutes. Vankirk spent the bulk of his winnings treating all his men to an excellent supper.

The brick making record apparently has not been beaten since 1886, when John Watkins, of Baltimore, made 922 bricks in 55 minutes. He was assisted by two men to carry off the bricks and a "wheeler."

Considers Brick More Fireproof Than Concrete

THE brick men of the Pacific Coast have a new champion in Mr. T. J. A. Tiedemann, an insurance expert who recently addressed the Pacific Coast Underwriters on the question of "Building Construction and Rates." In the course of his remarks he cited a number of cases where brick had proved to be superior to all other building materials. Extracts of Mr. Tiedemann's paper are given herewith:

"As a result of the conflagration in 1906, many defects in material were exposed, particularly in respect to the various kinds of stonework. Granite, limestone and in some cases sandstone proved wholly unsatisfactory, being so badly damaged by the heat as to require replacement, partial or complete, in nearly every instance. Marble fronts and stairways also developed serious defects, and in the case of steps, it was demonstrated beyond question the absolute necessity of metal supports underneath. Defective flooring in steel frame buildings was another of the structural defects most noticeable after the fire. Hollow tile flooring, when not reinforced, was practically worthless, permitting, as it did, safes to crash through from upper stories to the basement. One of the best examples of this defect which came under my notice was in the Mutual Life building on the corner of California and Sansome streets. In this building a safe crashed down many stories, leaving apertures almost as large as an elevator opening for the flames to shoot through. Pressed brick and common brick walls in which cement mortar was used, i. e., honest brick work, proved conclusively that as a fire-resisting material it is superior to the various kinds of stone, and the only reliable barrier to check the spread of flames. Of reinforced concrete buildings, we did not have any in the fire zone. Therefore, an opinion based upon experience in this conflagration cannot be formed as to the fire-resisting qualities of this class of structure. We must also have demonstrated the adaptability and suitability of the various kinds of crushed rock and other materials used in the mixing of the concrete, together with the sand used here, for the production of a first-class structure of stability and durability. In the case of foundations, it was clearly proven that in San Francisco, where the earthquake hazard has to be considered, the foundations should be most homogeneous in construction.

"It has been argued that concrete foundations on piling are superior to any other. I do not wholly concur in this, my ideas having recently been changed. I believe that well-burnt brick, laid in good cement mortar on piling or other good base, is as durable and serviceable as concrete. As an illustration of this, and to support my statements, I would draw your attention to the foundations recently removed from the site of the old Balfour, Guthrie building on California street and from the west wall of the destroyed building of the New Zealand Insurance Company. These foundations were put in over forty years ago, and were of good brick, laid in cement mortar, all resting on massive timbers placed horizontally. These timbers when taken out were found to be as sound as on the day they were put in. A careful examination of those walls showed that they had sustained no damage from the earthquake, and, despite the fact that the ground was wet all the time, were so solid as to defy attempts to break them with picks or sledges. Drills and sledge hammers were finally used, and the foundations pried out in small sections. The solidity of those walls spoke volumes for the honesty of the work in their construction. The objection to this class of foundation is, however, that it

is more expensive than concrete, inasmuch as the excavations have to be considerably deeper and require a much wider base terraced to the width of the proposed walls. From inquiries made in this matter, I find that the relative cost is in the ratio of 5 to 3.

"Another foundation that has just been exposed to view, the debris of the ruined building having been removed from it within the past month, is on the site of the Fair building on Montgomery street next to the Mills building. These and other examples of foundations put in many years ago in San Francisco will suffice. I feel sure, to convince in a great measure even the most skeptical. From the foregoing illustration it is apparent that as an all-round building material, durability and fire-resisting qualities considered, and from an expense point of view, a well-made and properly burned brick, laid in good cement mortar, is the superior of all materials.

"Assuming that my claim of superiority of brick as a building material is correct, and taking into consideration the object lessons presented at the time of, and immediately after the conflagration in San Francisco, when the walls and remaining portions of destroyed buildings, and those gutted by fire, cooled off, exhibiting many serious defects in all building material, other than brick, the question presents itself, 'Should not differential rates be applicable when computing the special rates on new buildings, having exterior walls of brick, granite, sand or other stone?' Personally, I am convinced that this should be done. I believe I am not in error when I state that on this coast there is no scale of charges for different materials. A steel frame building of fireproof construction, with exterior or panel walls of granite, sand or other stone, takes the same rate as an equally well constructed building whose panel walls are brick, with sills, cornices, etc., of similar material, or improved terra cotta. I am opposed to this rule, and believe the time has arrived when we should revise our rating schedule for various mercantile buildings. Taking the results of the Baltimore and San Francisco conflagrations as guides, I should grade building materials as follows: First, brick, or brick with improved terra cotta facing. Second, reinforced concrete. Third, sandstone. Fourth, marble. Fifth, granite No. 1. Sixth, limestone. Seventh, granite No. 2. In support of my contention in this respect, I will take as examples for comparison the following buildings, as they appeared after the fire of April, 1906: Merchants' Exchange, Mutual Life, Union Trust, Mills, Crocker, Woolworth Bank and Flood building. In this I shall forego reference to steel frames, etc., and confine my criticisms to the exteriors. The brick walls of the Merchants' Exchange were but slightly damaged and otherwise discolored, but aside from some cracks in the east and rear walls, showed no serious structural defect as the direct result of the fire.

"The Mutual Life building, admitting its inferiority structurally, was, with its heavy columns, caps and bases of granite, badly wrecked. While the upper half of the building has been taken down, the damage to the granite caps and bases can still be seen and estimated by visiting the building and viewing that portion left standing and at present occupied. In my opinion, it affords the very best lesson of the great damage that can be done by fire to semi-coarse and coarse-grained granite, of any building that was destroyed in the April, 1906, conflagration."

* * *

Dry Weather

They hired a girl to dust,
A girl both tried and trusted;
She took all the dust in sight—
And then the dust girl dusted.
—Chicago News.

Plans for the San Francisco City Hall—An Architect's View

[The following letter was sent to the San Francisco "Chronicle" in protest and in answer to its editorial of April 5, 1909. The "Chronicle" refused to print it, but published another editorial on the Sunday following, which quoted half of the fourth paragraph of this letter and suppressed the rest. The part quoted was made ridiculous by a misprint and the whole argument, of course, rendered futile and foolish.

What I want to make clear is that if the "whole world," as the "Chronicle" says, is to enter the competition it will so discourage local men that few will respond who otherwise might be encouraged to do their best. Nor must it be forgotton that all over the Eastern States alone there are ten draftsmen fresh from the Boston Tech. or Paris, etc., to one out here, and that their valuable services can be secured by firms of architects in the East for half the wages paid in California. It is this discouraging handicap, more than any other perhaps, which brings to a wide-open competition here so much less response than goes to a close one, where the conditions are fairer.

If our large competitions are so conducted that local men are discouraged from competing, how can that local spirit be developed which all consider so desirable and which alone develops worthy architecture?—B. J. S. C.]

Office of Wright, Rushforth & Cahill, 571 California Street.
San Francisco, April 5, 1909.

Editor San Francisco Chronicle.

Dear Sir: Monday's issue of your paper had an editorial admonishing the municipality of San Francisco to make the architectural competition for the new City Hall "open to the whole world."

There is something seemingly big and splendid about this way of talking. I have heard it before on similar occasions, and in most cases it has the desired effect of stifling any protest from those architects who live and carry on their business here and who are usually alluded to in a sort of semi-contemptuous way as "local men." Living in a sort of province, as we do, we would, of course, rather die than be thought provincial. And so, when it is put to us in this way we gracefully yield and let outsiders come in and enjoy privileges that in other communities are reserved for home consumption.

The statement that San Francisco is "too large a city to bother as a municipality only with its own people" means that the bigger a city grows the less self-sufficing it becomes. In my humble opinion, the exact opposite is nearer the truth. It is the small, immature city that must call in outside aid. In its earlier stages a new town gets everything it wants bodily from afar, and we trace its growth into a city and a metropolis by every new industry and art that it develops of its own. San Francisco has grown to maturity and is undoubtedly a metropolis. We have developed ourselves, not only to the industrial, but to the professional, even to the specialist stage. Our legal, surgical, technical skill of all kinds ranks with the best, and while we do not need to forbid outsiders to enter, we need not invite them nor go out of the way to encourage them. We have talent enough of our own—in architecture, at any rate. If we have shown any immaturity and lack of skill, it is not so much in housing our municipality in the right kind of City Hall as in filling our City Hall with the right kind of a municipality. The business of a city is more important than the mere building in which it is conducted. Why not invite the whole world to govern us? Why not import a Board of Supervisors from Birmingham or Berlin? I well remember, before the fire, receiving a series of supplications from the Merchants and Producers' Association or some such body. All our architects received these circulars, which implored us, for the good of the community (and the undersigned), to remember home products, and in writing our specifications, to call for local materials, etc. Such an appeal in a small, immature and undeveloped community obviously limited in skill and

resources has its ridiculous side which creates the prejudice first shown in your editorial.

There is nothing wrong whatever about San Francisco's endeavor to create sentiment favoring the consumption of home materials. In fact, while the movement is a purely selfish and business one, it can none the less be defended from the loftiest standpoint. Any great and original architecture or art is largely developed by the use of materials right at hand, and in submission to conditions entirely local. Great architecture has been developed intensively in cities and small communities rather than extensively in states and empires; witness Athens, Corinth and Delphos, or Florence, Pisa and Venice. Gothic architecture was also developed on lines of urban rivalry. Cosmopolitanism on the American continent has done little more than to diffuse knowledge and develop taste. Provincialism, on the other hand, has given us the only discernible germs of an indigenous architecture that we have in the New World, namely, the English and Spanish Colonial.

We have with us an abundance of the cosmopolitan cult as well as colonial enthusiasm, to blend or to choose from, and plenty of architects competent to solve the whole problem.

This brings me to the point made in your editorial, that our architects "would be inspired by the thought that they are in competition with all the world." Some years ago an architectural competition was inaugurated here, with invitations flung out broadcast across the whole planet. How did that inspire our local architects? I know of only two other men on the Pacific Coast besides myself who entered.

From the glib way the average citizen erroneously alludes to architects "bidding on a job," I gather that the merest fraction of the community has any conception of the vast amount of education, technical training, experience and outlay of time and money involved in getting up a first-class set of plans that will stand any chance of success in an up-to-date competition. Since the diffusion of Beaux Arts standards throughout the country the mere technique of an adequately presented scheme demands extraordinary skill, which must in most cases be paid for in hard cash. If fifty architects compete out of our two hundred and fifty in the northern district of California, only one will be chosen and about forty-five will have done in the aggregate an enormous amount of work for absolutely nothing. And now the newspapers are teaching, and our citizens generally are beginning to think, that the competing architects will be tickled to death to have their chances of winning still further reduced a full hundred per cent.

While some architects might agree to an open competition if it were put to them in public, rather than appear small and selfish (as they think), it is absurd to suppose that any one of them, from any motives whatever, prefers to make still slenderer his already miserable chances of success. Architects who do not intend to enter the competition, or architects who ex-officio are debarred from so doing, may, of course, express other views without stultifying themselves. Personally, I think they should help their brethren out, and I also think that not only the public at large, but the newspapers (who know well enough how metropolitan and how self-sufficing we are along about New Year's time), should lend support to our own architects who intend to risk so much for so small a chance of winning.

As for our manufacturers and producers and the varied interests in the building trades line, that got out those petitioning circulars addressed to architects, it appears to me that it is their duty to bring their united influence to bear on the Supervisors, persuading them to limit the competition of the new City Hall to those architects licensed to practice in the Northern District of California, and to no others. Yours, etc.,

B. J. S. CAHILL.

Facts and Freaks in Concrete Construction

By W. W. BRIDGEN.*

THE mighty impetus given to concrete work, both reinforced and plain, during the last five to ten years, has made it somewhat difficult for engineers not having unusual advantages to keep pace with the latest and best that is known in those lines. The writer thinks it a disgrace to the profession that so many engineers have failed to make themselves acquainted with what could easily be known by reading any of the best books on concrete lately published and gleaning from periodicals.

Is it right for an engineer to accept sand and gravel containing two to three parts, by measure, of sand to one of gravel when most authorities say these proportions should be reversed? A very good proportion for ordinary engineering works is one part Portland cement, three parts sand, which will pass through an ordinary brickmason's screen, ¼-inch mesh; four to six parts gravel, from ¼ inch to 2½ inches diameter. These proportions will do for more than nine-tenths of our engineering works. If we can believe the results of careful investigation by the best authorities, the relative proportions of sand and gravel should be nearer one of sand to three of gravel than one to two, which is the proportion largely used by those who have regulated this matter at all carefully.

The writer has screened many samples of sand and gravel, as they come from the pit, and has seldom found as much gravel as two to one, even on a 1-16th-inch mesh screen, and does not remember one case where it was as high as three to one; although there are places, no doubt, where that grade could be had. It is admitted that it is expensive and often difficult to separate sand and gravel so as to measure out the proportions of each accurately, but this is not necessary. Much more necessary is the gradation as to size. Frequent samples can be screened on small hand screens with 1-16, ⅛ and ¼-inch mesh; the work to be largely done by the inspector or foreman, and averages close enough for practical work obtained. It will not be long before the party making the inspection will be able to tell at a glance about what grade is being delivered, and his objections and instructions to the teamsters doing the hauling shall generally cause them to load the proper material at the pit.

The sand and gravel for the Michigan Central tunnel at Detroit is obtained from the St. Clair river near Lake Huron, and it was found the proportion of sand and gravel and grading same often varied seriously from contract requirements. The proportion and grade were shown to the contractor's men, and it was found that at certain places the required material was readily obtainable.

The writer ventures the assertion that almost all the engineering and building work done in small cities and three-fourths in large places is done with sand and gravel just as it comes from the pit, with no proper endeavor to grade and to get enough gravel to obtain the best results from the mixture.

The author has seen building contractors in Battle Creek use three parts of sand to one of gravel many times, and has known contractors to insist on using the material nearest at hand, even when it contained excessive amounts of loams or clay in addition to an unduly large proportion of sand. If anything is said to a contractor on this subject he generally replies that he bid on the basis of sand and gravel as it comes

*Mr. Bridgen, is the Superintendent of Water Works, Battle Creek, Mich. The paper printed here was read before the Michigan Engineering Society.

from the pit, and he then proceeds to enumerate the various works he has done and to say they are there yet, he has tried them and they are as hard as the best stone, or harder. Sometimes they come to grief, but the trouble is never admitted to be in the proportions of sand and gravel.

We have tried four or five continuous mixers and found them better and much cheaper than the batch variety. Nearly all have some kind of adjustable feed that works automatically. One mixer had been employed on a business building in our city before it came to the concrete sewer we were constructing. A portion of this sewer was reinforced and, having almost no earth cover, was made of a nearly rectangular section, and a mixture of six parts aggregate to one of cement was used. We had reached deeper cutting, changed to circular form and, I believe, were using a seven to one mixture, when this machine was put in use. The change in color as the first concrete came from the machine indicated immediately that there was a great lack of cement. The men were told not to use any concrete until several sacks of cement were added to get somewhere near the proper proportions. On questioning the man sent with the machine he admitted the machine was set at twelve aggregate to one cement, and used that way at the store building. To make the matter worse, the material used for concrete was largely obtained from the cellar excavation and probably contained from one to three parts of sand to one of gravel.

Do not use wooden forms for concrete sewers. We have tried both and find the collapsible steel center cheaper and it makes a much smoother job inside. We moved the invert forms after 24 hours set and the arch forms after 48 hours. The same was true of wooden forms, even in cold weather.

A large food factory, about five stories high, was constructed largely of concrete, including floors and roof. The sand and gravel used on this building all came from the part of the city where the building is located and runs, say, 1½ to 2 sand to 1 of gravel, not half enough gravel, if we are to believe Prof. Newberry of the Sandusky Portland Cement Company, W. B. Fuller and other authorities. Some good authorities assert that one cement to eight sand and one gravel is one only-tenth as strong as concrete with one part cement, two and a half parts sand and six and a half parts gravel; the gravel and sand being carefully graded from a little over 2 inches average diameter down to particles not visible to the naked eye. In both cases an equal amount of cement and aggregate is used. In the first mixture, it is the writer's opinion, two parts of cement, instead of one, would be necessary to make admissible work to be used in ordinary every-day structures.

The writer has made a few experiments, among them some in which was used a 15-inch piece of 12-inch pipe, with plug leaded into the bottom. In this form were rammed various amounts and grades of aggregate; the gravel carefully screened through several screens of different mesh. Cement was used, so as to conform as near to every-day practice as possible. It was found that the closer the uniform grading the smaller space the material filled, showing the voids were considerably reduced, the greatest difference being as much as 10 per cent. Such fine gradation is not practicable in actual construction; but an approximation, such as will be very valuable, is obtainable, even in contract work, by proper provisions in the specifications and intelligent, persistent inspection. We do our own work by day labor, which gives a control of the details of concrete aggregates not easily attainable with an old and experienced contractor. A large number of contracts have been drawn requiring all sand and gravel to be screened and measured, but the writer does not remember one piece of construction of any magnitude where it has been done, although there are cases, without doubt.

It is a disputed question whether Portland cement concrete receives injury from freezing during its initial set and for some hours thereafter. A concrete wall, say 2½ feet high and 2 feet thick, was constructed along a lake shore late in the fall. Its bottom was above the existing water mark and no part of it was hid in water. The proportions of cement and aggregate are not known, but, judging from appearances, it was not a rich mixture. That portion first constructed is in very fair condition, but the balance, which was done during hard freezing weather, has peeled off at the face so as to spoil its appearance at close view and in some cases the wall is inferior two inches inward from the face. The mixture was very wet or what is denominated "sloppy." Perhaps had the mixture been richer in cement or been put in dryer it might have passed through the cold weather without injury. Measures to protect the wall, by the use of lumber and timber, were used, but they were not very successful, although probably doing some good. The writer often uses lumber, tarred paper, etc., in freezing weather, placing lighted lanterns every twenty to forty feet, under the lumber and paper. These have proved invariably successful in sewer trenches and are not expensive. There is considerable heat in cement itself and this heat, with that of the lanterns, will keep the concrete from going below freezing until it is past danger. It may be that good concrete, unless too wet, will not suffer if unprotected, but until we are far more sure of this than now let us take the safe side.

Do not use rotten or soft stone in concrete if you can reasonably help it, especially in light construction. We once tested several 6-inch by 6-inch reinforced pieces with 4-foot span. There was a soft piece of sandstone in one, nearly 3 inches in diameter, 8 or 10 inches from the center of the span. The concrete broke right at that stone and with less strain than was given some other pieces.

Most engineers prefer mild steel for reinforcement, but some use the "high" grade because of its greater tensile strength. The writer once thought there was little difference between the two and, as mild steel could not be had in time, took some of that with high carbon. We tested this steel by bending ⅝-inch square and ½-inch round deformed rods back on themselves. Most of the rods stood this and some other tests well, but, having some of them left, they were used as anchors for a concrete seawall.

* * *

The Jack, the Jenny and the Mule

"Any machine or apparatus for lifting has been called a 'jack' since the days of Shakespeare," says Elbert Hubbard. "The jack was a bearer of bundles, a lifter, a puller, a worker. . Any coarse bit of mechanism was called a jack, and is yet. The jack was anything strong, patient and serviceable. When Hargreaves, the Lancashire carpenter, invented his spinning-machine, a village wit called it a 'jenny.' The machine was fine, delicate, subtle, and as spinning was a woman's business, anyway, the new machine was parsed in the feminine gender. Soon the new invention took on a heavier and stronger form, and its persistency suggested to some other merry villager a new variation and it was called a 'mule.' The work stuck, and the mule-spinner is used wherever cotton is spun."



Los Angeles County Hall of Records, Los Angeles, Cal.
Hudson & Munsell, Architects

As An Eastern Architect Sees the Pacific Coast

THAT a trip to the Pacific Coast would be conducive to a greater breadth of view to Eastern architects is the opinion of W. S. Eames, of St. Louis, who has been recuperating from anillness at the home of Architect A. F. Rosenheim in Los Angeles. Mr. Eames, who is a past president of the American Institute of Architects, having presided over the destinies of the institute during 1904-05, and is a member of the Art Commission appointed recently by President Roosevelt, has given out for publication portions of his letter to Mr. Glenn Brown, secretary of the institute. The extracts follow:

"I am writing especially regarding matters pertaining to the institute; first in congratulation of the appointment by President Roosevelt of an Art Commission, which I think is a most important step in the direction of our ambition of past years, and one which involves, upon our part, the most careful management at the beginning, in order to reduce as much as possible the

friction that will be encountered among certain of the Representatives. The Senate, with Senator Newlands' valuable assistance and advice, will doubtless be more readily brought to the support of the plans of the Park Commission.

"It was my good fortune to informally attend a meeting of the local chapter of the institute. The meeting was held at a popular cafe where dinner was served and the business meeting followed directly thereafter.

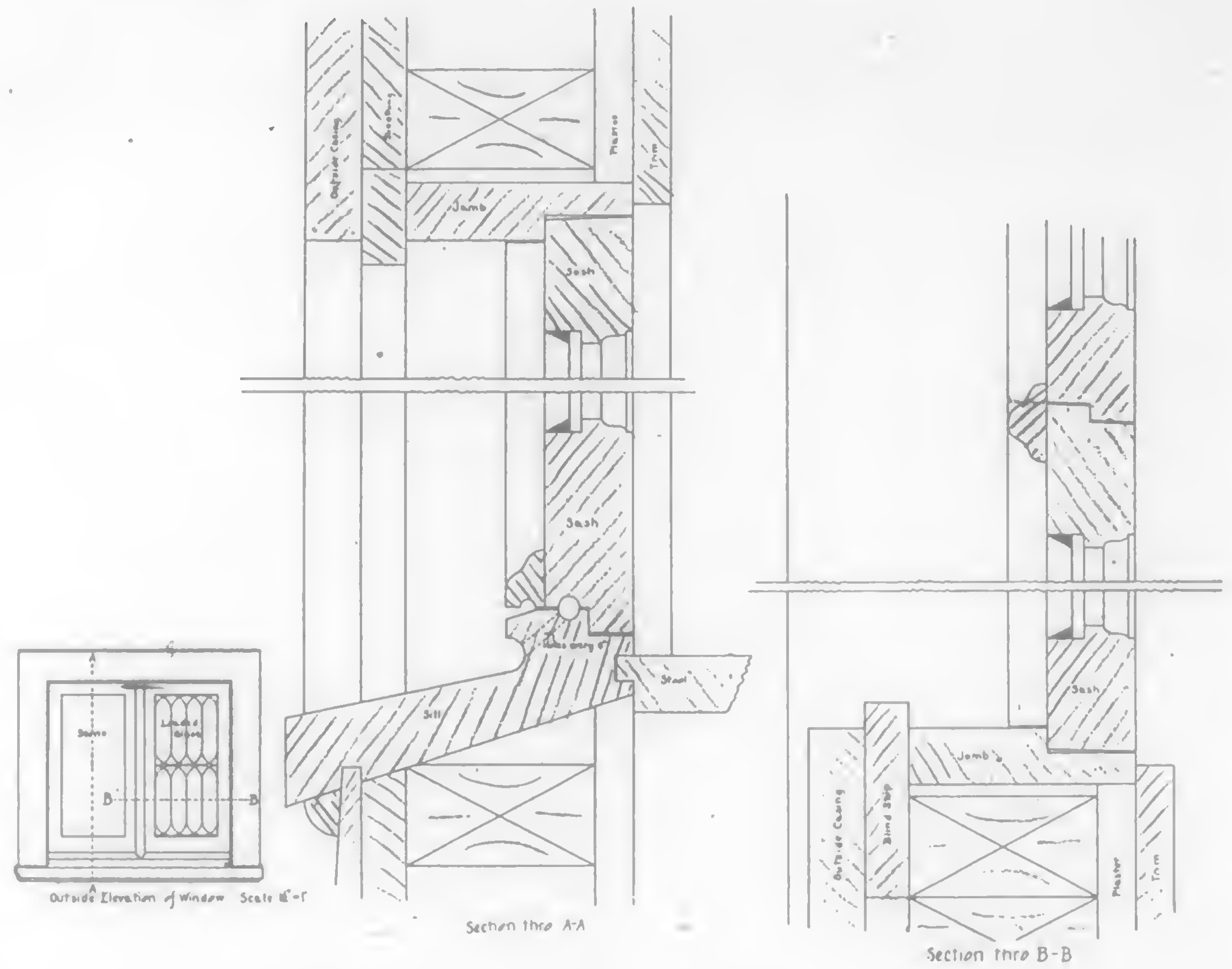
"I was surprised to find more than twenty members of the chapter present, and to learn that it was not at all uncommon to have their regular meetings attended by as many as thirty-five, and that the full membership was something more than fifty.

"The proceedings of the business meeting indicated a most active working body, the members evincing a lively professional interest in all matters discussed. The president, Mr. Myron Hunt, presided, and the minutes of the previous meetings were read by the secretary, Mr. Parmentier. Under the heading of 'Correspondence' there was presented a communication from the Architectural Club of Portland, Oregon, inviting the co-operation of the Southern California chapter in an effort to organize a 'Pacific Coast League of Architects.' This communication provoked considerable discussion, and it was brought out that among the members of the institute located on the Pacific Coast but few had been recognized in the councils of the institute, and that no regard was paid to an effort made at the last convention to secure recognition on the board of directors, although the nominating committee had made such recommendation.

"The principal speaker on the subject of this correspondence was Mr. Octavius Morgan who had attended the last meeting of the institute at Washington, it being his first experience at a convention. He seemed to be much impressed with the position and standing of the institute and spoke with considerable warmth against any attempt to establish a new association. While he deplored the fact that the Pacific Coast enjoyed but slight participation in the important affairs of the institute, he urged the view that any effort to advance the profession, other than through the institute, would be futile. The whole discussion of the subject terminated in the endorsement of Mr. Morgan's views, and I was given an opportunity of speaking upon the same subject, which I did as well as I could under the circumstances, feeling far from well.

"I mention this matter somewhat at length, so as to bring to your attention, and through you to the notice of the board of directors, the importance of giving careful consideration to the selection of the next place of meeting of the institute. I understand that a resolution was passed at the last convention to the effect that in the event of the next convention being held in any city other than Washington, D. C., it would be held in Los Angeles, California. So far as I can judge from the conversation of members who were in attendance at the last meeting at Washington, the whole affair was a pronounced success, and possibly this fact would justify holding the next convention elsewhere than in Washington, leaving to the board of directors and executive committee of the institute, and to the recently appointed Art Commission to do what work they may find necessary with Congress until the following year.

"Furthermore, I think it would be a wholesome thing for the Eastern members of the institute to do a little traveling and see some of the wonders of this great country of ours. There are some very good fellows in Boston, Philadelphia and New York, as well as in Washington and other Eastern cities, who need a little breadth thrown into their natures, that they cannot get from a trip abroad in the 'Effete Capitals of Europe' but will surely get in crossing the great Western plains and in experiencing the marvelous beauties and wonders of the Pacific Coast.



Detail of French or Casement Window that swings in and out, is waterproof, and has many advantages over the Common Window

"In my opinion it will be better to have a convention in Los Angeles with a bare quorum than to have one hundred members present at any meeting that might be held east of Omaha. The states of Washington, Oregon, California, Nevada and others are well represented in Congress, and should be considered."

* * *

Accepting the Lowest Bid

SECRETARY GARFIELD, of the United States Interior Department, at a recent conference of supervising engineers, made some observations upon the matter of accepting the lowest bid, his views being emphatically against it where there is doubt. Inasmuch as there is a sort of fetich in favor of the lowest bid under any and all circumstances, this view from a high government official is interesting. His statement is as follows:

"When the bids come in I want the local men never to hesitate to throw out unduly low bids. There is nothing more distressing to the department than to deal with a failing contractor. The mere fact that it is the lowest bid gives the presumption that it ought to be accepted, but if any engineer knows that a contractor has made a mistake or is not qualified or is not responsible, or is negligent in the method of performing his work, that should be one of the prime conditions to be considered in making a recommendation for or against giving the contract to that contractor. I always want the word 'responsibility' to be given the fullest meaning that the law will allow it. It must be the responsible bidder in every case. Much of our difficulty has been in dealing with men who were not responsible."



Lobby, Hotel Stewart, San Francisco.

Building Equipped with Otis Elevators *Cunningham & Politeo, Architects*

Decorative Features of The Hotel Stewart, San Francisco

By C. WALTER TOZER.

TO the proprietors, Mr. Charles A. and Miss Margaret Stewart, and to the architects, Messrs. Cunningham and Politeo, much credit and praise are due for the exceedingly homelike and successful Hotel Stewart. I mean successful, not only from the view point of patronage, but more especially from that of its architecture, arrangement, equipment, decoration and furnishing. Although a much smaller and less pretentious house than either the Hotel St. Francis or Fairmont Hotel, it commands the same admiration for its type that the two above mentioned hotels do for theirs. It seems that something truly worth while and good has been done in the Hotel Stewart when it is so favorably compared with the larger and more costly hotels of San Francisco and other cities. Although a large sum of money has been expended in its construction and furnishing—nearly two hundred thousand dollars having been spent upon the furnishings alone, still the investment can not be compared to the sum appropriated for the same purpose by some of the larger hotels of San Francisco.

The Hotel Stewart was opened upon its completion, December first, 1907, under very auspicious conditions. It was the first of the smaller high-class hotels to begin business after the fire in the down-town district. It is admirably located on Geary street, just above Union square, and directly opposite the Hotel St. Francis. The building occupies a ground area of 100 feet by 137:6 feet, and rises to a height of seven stories. It is of steel, brick and stone construction, the front being of Utah sandstone, while the side and rear walls are of brick.



Lobby, Looking South, Hotel Stewart, San Francisco
Cunningham & Politeo, Architects

From the main entrance on Geary street one passes into the lobby, and is immediately impressed with a feeling of exquisite comfort and quiet elegance. This room is of splendid proportions and follows the English style of treatment.

Very simple lines have been used in its architecture, decoration and furnishing. A very happy and pleasing effect, however, has been obtained by color harmony more than by ornamentation or showiness.

A wainscoting, composed of recessed panels, of Jenisero wood (a new Brazilian hardwood) extends about two-thirds to the ceiling, leaving a slight wall area above, which is artistically handled in plaster ornamented panels. The color scheme is in brown, the woodwork all having been finished in the natural brown of the Jenisero. The wall panels above the wainscoting have also been treated in two tones of brown in much lighter shades than the woodwork. The ceiling is handled in old ivory, all the plaster ornamentation in the beams being in the wiped-out treatment.

The floor is of small tile in amber tones, having a mosaic border in deeper tones of brown. Large brown Berlin rugs are used, they being severely plain, with only a line border of deeper brown. Oak furniture, of very pleasing and comfortable appearance and finished in brown is well distributed throughout the room, making of it an exceedingly home-like one. At the windows, facing Geary street, brown velour hangings are used so that the color harmony is unbroken throughout. The electric fixtures, splendidly detailed, are of iron, finished as antique brass, thus carrying out the color scheme also.



Lobby, Looking North, in the Hotel Stewart, San Francisco
Cunningham & Politeo, Architects



Private Dining Room, Hotel Stewart, San Francisco
Cunningham & Politeo, Architects



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Cunningham & Politeo, Architects

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Lobby, Looking North, in the Hotel Stewart, San Francisco
Cunningham & Politeo, Architects



Private Dining Room, Hotel Stewart, San Francisco
Cunningham & Politeo, Architects



A Three Room Suite in the Hotel Stewart



Buffet in the Hotel Stewart, San Francisco
Cunningham & Politeo, Architects

To the right of the main entrance is the ladies' parlor. This is a very small room, but notwithtsanding its size, a thoroughly appreciated room. To add to its appearance in size, however, a very successful scheme has been adopted by the introduction of a pair of false French windows. On the west wall a large pair of French windows, glazed with mirrors, has been introduced, giving the room a much larger appearance. The woodwork has been treated in white, which seemingly gives the room more space. The color scheme here is antique rose, the floor covering being of rose colored plain Wilton carpet, the silk hangings at the false windows in rose, and the walls beautifully paneled in Louis XVI style, with rose colored wall paper. Mahogany furniture is used, and the whole effect of the room is very pleasing.

Passing on through the lobby to the southern end, one enters the main dining room. Here the eighteenth century English style has been made use of with a very successful result. Large Ionic columns and pilasters support the ceiling, which carries no ornamentation. The walls are paneled in plaster, each panel having been filled with canvas, painted white and stippled. All the woodwork has been enameled white and rubbed. The walls and ceiling are also painted white. The color scheme of the room is white and green, the green being introduced through the carpet—a high pile Wilton of small design—the upholstering, and by the use of palms and other plants. The south end of the room has large windows, which have been recessed, and they carry a wealth of potted greens. False French doors, glazed in mirrors, have been used here also. The chandeliers and bracket lights are of crystal and the metal parts in silver finish. Although no elaborate treatment has been attempted the room is rich enough for a most elaborate banquet or reception, and simple enough for every day usage.

In conjunction with the main dining room a private dining room of unique features has been provided. This room adjoins the main dining room, and is used for private luncheons and dinners. Its style is a modified art nouveau. The room is paneled throughout. The lower part of the walls are done in narrow upright panels filled with a pastel tone of terra-cotta crash. A shelf rail separates this section from the upper one and this portion is paneled in square panels, each panel carrying a stencil design in soft pastel shades. The ceiling is also paneled in wood. All the woodwork has been painted an old ivory tone. The chandelier and bracket lights have been specially designed to conform to the detail of the brackets appearing in the room.

The buffet opens onto Geary street and is treated most charmingly as a Dutch room of the Biedermeier type. The floor is of small white and yellow tile with the border of Dutch blue and yellow. The wainscoting is of oak, finished in Flemish, and the brackets of Biedermeier detail. The ceiling is arched and carries a number of beams running across the width of the room only. These are of plaster, grained the same as the woodwork and lined off in yellow. The wall space is tinted a strong yellow with a stencil design in blues and reds, high lighted in yellow.

The six floors above the ground floor are devoted to the bed rooms and parlors, of which there are two hundred and fifty. The woodwork throughout the upstairs is white enamel in rubbed finish. The carpets are all Wiltons of small design in two tone effects. The furniture is all of splendid design and make, and is of mahogany and fumed oak. Perfect color harmony prevails in every room between carpets, hangings and wall papers.

At the present time an addition is being built, which will enlarge the main dining room and give the hotel another private dining room as well as seventy-five more bedrooms.

The equipment throughout is of the very best and the kitchen and refrigerating plants especially are as fine as can be found anywhere.



A Three Room Suite in the Hotel Stewart



Buffet in the Hotel Stewart, San Francisco
Cunningham & Politeo, Architects

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Equipped with Otis Elevators *White House, San Francisco* *Albert Pissis, Architect*
Exterior Iron Work Finished with Satinette White Enamel

White Enamel as a Decoration

By F. T. McHENRY.

THE use of enamels and the art of applying them dates back many thousands of years, even to the third century. In its commonest application, it is a sort of glazing and as applied by modern methods to ornament and protect surfaces, it may be considered a simple process of japanning. This is accomplished by applying various compounds which are "fixed" by fusing or baking.

We are all familiar with the beauty and the extreme durability of articles prepared by the Japanese and Chinese, such as fancy work boxes, tables and other small articles of furniture imported from eastern Asia. The art of japanning or enameling is supposed to have been acquired from the Japanese, whence its name. Other nations have taken up this art and to-day we have enamels that are applied on large surfaces for decorative purposes, where it is not necessary nor it is possible to bake or submit to heat for hardening.

It is important in selecting an enamel that great care be exercised. The average architect has not the time to study this important specialty, and because of this, many wrong principles are followed; therefore the object of the writer will be to give briefly some valuable hints for his guidance.

By far the most favored finish for high class decoration is white enamel. The architect who wants his work decorated in the very best style, to look well and wear well and to be easily maintained in perfect

cleanliness, knows that nothing but a high class white enamel can give the desired result and he is only safe in specifying an enamel that has been thoroughly tried.

The immense popularity of white work in recent years is remarkable. Wherever high class decoration is sought, there we find white enamel; but there are points to be observed in the selection of the material, as the ordinary enamel is apt to turn yellow, and what is more undesirable than a white turned yellow, or anything so distasteful as is an artificially "blued" white. The real thing is the pure snow white, with never a trace of "blue" or "yellow."

Another point to be looked for in a white enamel is its lustre. If a brilliant gloss is desired, it is disappointing to find, after a few months, your walls show an almost dead and lifeless effect. The gloss should be as imperishable as the color.

It is no use trying to cover up poor undercoats by a last coat of good enamel, it is only a waste of good material, and it is useless to have a hard, smooth foundation if the final coat is carelessly applied. It is the good work and the good material that pays. White enamel is suited for decorative work of every description, inside or outside. For house work it makes a most artistic, durable and sanitary covering. When soiled it can be washed with soap and water and made to look like new. For hospitals it is almost indispensable, as it is not affected by fumes, acids nor antiseptics. Leading hotels have selected it as a decoration. The railways are great users of white enamels, and by reason of its durability it is the first favorite of the ship builder.

To obtain the best results the following is suggested:

For Interior Wood Work, Plaster, Concrete and Brick Walls.

First Coat: Pure white lead in oil, broken in two-thirds pure linseed oil and one-third spirits turpentine.

Second Coat: Pure white lead in oil broken in one-third pure linseed oil and two-thirds spirits turpentine.

Third Coat: Pure white lead in oil broken in spirits turpentine only. By adding to the last coat of lead in oil twenty-five per cent of a high grade white enamel, an extraordinary result is obtained.

Fourth Coat: A high class interior white enamel.

Fifth Coat: A high class interior white enamel.

Of course enamels may be tinted to any shade desired. Under ordinary conditions three undercoats are sufficient, but should they not cover the work evenly, additional coat or coats should be applied.

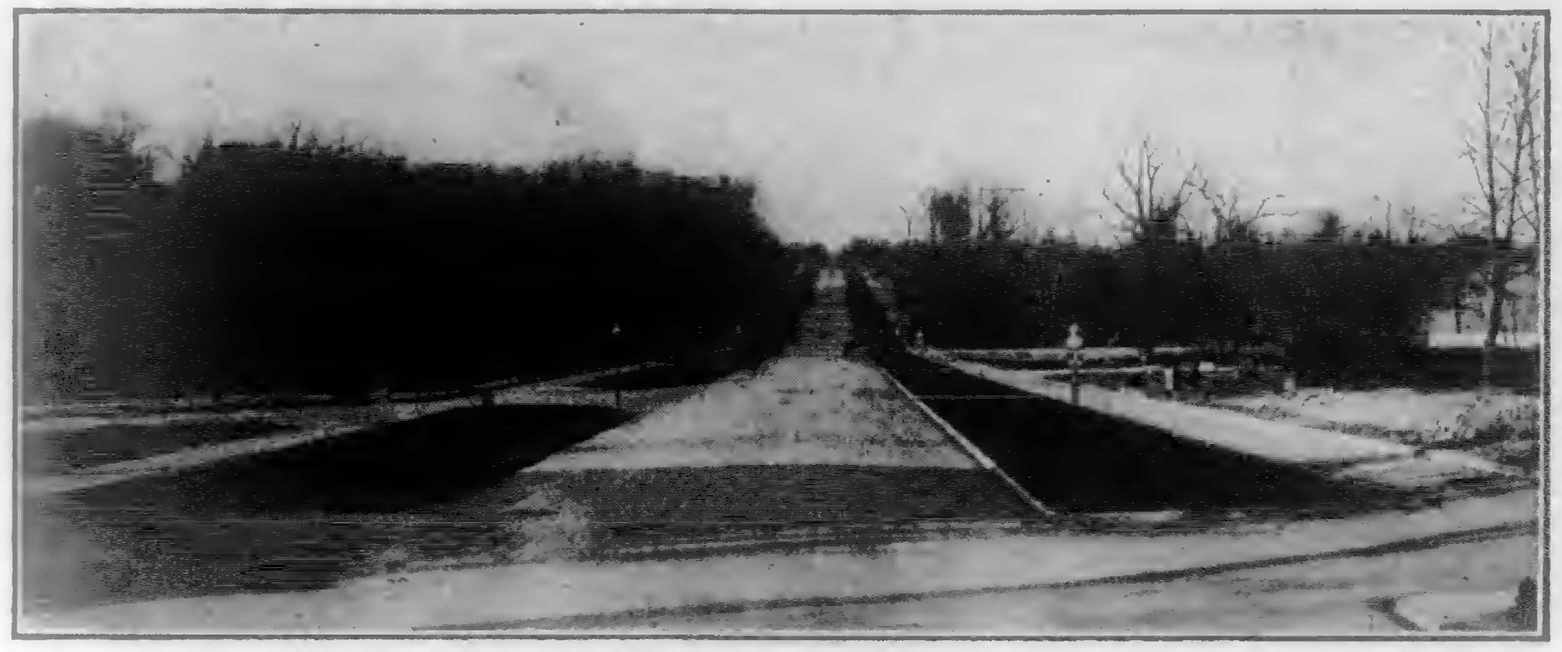
It is essential, in order to obtain the best results, that each coat should be thoroughly dry before the succeeding coat is applied. For a semi-gloss finish, rub the final coat with pumice stone and water. For exterior work, same as above, only use an exterior enamel.

In this connection it is well to remember that in enameling over a cement surface, the same rule will apply as obtains to ordinary painting, viz: that it is not safe to paint over a cement surface until it has stood for a long period or it has been first sized to kill the alkali.

* * *

All are architects of fate,
Working in these walls of time,
Some with massive deeds and great,
Some with ornaments of rhyme.

For the structure that we raise
Time is with materials filled;
Our todays and yesterdays
Are the blocks with which we build.
—Longfellow.



Charles Street, Avenue Boulevard, Baltimore. Paved with Bitulithic

Street Paving—An Important Decision Affecting Municipalities

THE following is an extract from the Boston Herald of January 8, 1909, which is of interest to all municipalities:

"The United States circuit court of appeals for the sixth circuit, sitting at Cincinnati, has handed down an important decision, involving the validity of a patent granted to Warren Brothers Company of Boston for the wearing surface of a street pavement commercially known as the 'bitulithic pavement.'

"The suit for the infringement of this patent was brought by Warren Brothers Company about four years ago against the city of Owosso, Mich., for a street pavement laid in that city by the Barber Asphalt Paving Company under an agreement to protect the city from all liability against suit for infringement of patents. The case was defended at great length, and regardless of expense, by that company, although it was not formally a party to the suit.

"The decision rendered is one of very great importance to all municipalities throughout the country, as the decision of the circuit court of appeals in patent cases is final.

"The introduction of the bitulithic pavement began in the year 1901, and has since been laid under Warren Brothers Company's license in more than 150 cities throughout the country to the extent of over 9,000,000 square yards, or more than 500 miles of city streets.

"The Barber Asphalt Paving Company and its allied companies from the first denied the validity of the patent, and offered to municipalities in general to construct pavements as called for by the patents, and to indemnify the municipalities against loss for infringement.

"But comparatively few municipalities, however, were willing to avail themselves of such an offer to become a party to such an effort to deprive the owners of the property rights secured to them under the patents, in almost every instance the city officials having either adopted specifications calling for the patented pavement, or decided to await the final decision in this case.

"The district judge of Detroit, before whom the case was first tried, dismissed the bill without definitely passing either upon the fact of infringement or the validity of the patents, both of which defences were made to the suit.

"By the decision just rendered both the fact of infringement and the validity of the patent relied upon in the suit have now been finally adjudicated by the court of last resort having jurisdiction of this case.

"The case has been in the courts for over four years, and the record and briefs cover over 2000 pages of printed matter, the literature and history of the street paving art, having been thoroughly gone into by the examination of over 30 city engineers selected from all over the country, and the best expert witnesses upon the street paving industry and the interpretation of patents for street pavements that could be found.

"The defendants failed to produce a single instance where any street pavement had ever been constructed anywhere, either in this country or in Europe, in accordance with the claims of the patent in suit, having rested their defence of anticipation upon the production of a small bit of sidewalk laid in front of the Barber Asphalt Paving Company's testing laboratory, which was never duplicated even as a sidewalk, and an abandoned reservoir lining found somewhere in the East."

The street pavement covered by the above decision has been contracted for in many cities on the Pacific Coast during the past six years under the name "Bitulithic," among them being Portland, Salem, Eugene, Roseburg, Albany, Medford and Pendleton, Ore.; Walla Walla and Vancouver, Wash.; Boise, Lewiston and Nampa, Idaho. The pavement has become generally popular throughout the entire Northwest, both for business, residence and boulevard traffic.

In the decision above referred to the Court said among other things:

"The street pavement of the Warren patent is plainly differentiated from the pavement structures in practical use before his invention, and no serious effort has been made to show its anticipation by any of the known and practical methods of making roadways. The old and well known forms of such structures included roadways made of granite or other hard stone blocks, vitrified brick, blocks or strips of wood and the well known macadam. A more modern, and yet well known, pavement is known as sheet ashphalt. Each of these forms had its well known advantages and disadvantages. The structures of blocks of granite or other stone, or brick, were notably durable but they were noisy and slippery. Blocks of wood become too smooth and slippery. A defect common to all block pavements, whether of wood or stone, or brick, is that their joints become harbors for filth, causing such pavements to become very unsanitary. The macadam was made entirely of stone broken into pieces of irregular sizes and laid in layers, the bottom one being generally of large cracked stone filled in with finer stone. Over this was laid a layer some inches deep of broken stone rolled down with heavy rollers and on top a surfacing of fine stone dust, which, when wet formed a temporary cement. This is not particularly noisy, but in wet weather is muddy or pasty and in dry weather very dusty. In durability it was very defective. The macadam roadway is the foundation ordinarily for the Warren bitulithic structure, as shown by the specifications of the patent.

"The sheet ashphalt pavement belongs to a later class and, like the Warren pavement, is intended only as a top or wearing section over a foundation of broken rock like the ordinary macadam. The surfacing of the pavement is composed of sand with the interstices filled with bituminous cement. If made with a bitumen hard enough to constitute a rigid structure at summer temperatures—it is shown to be so brittle in severe cold as to crack and break up under traffic. If soft enough to resist the breaking effect of traffic during cold weather—the evidence tends to show that the grains of sand through friction slip by each other, and under the influence of traffic the sheet surfacing is subject to be pressed into irregularities, making an uneven or humpy surface, resulting in disintegration. Neither is such a pavement so waterproof as to prevent altogether the penetration of water with bad results. Aside from the



Bitulithic Pavement on Fifth Street, Portland, Or. Laid by the Warren Construction Company



Bitulithic Pavement on Yamhill Street, Portland, Or. Laid by the Warren Construction Company

defects in the matter of durability under ordinary street traffic conditions, it is shown that the standard asphalt pavement is unduly slippery and affords a bad footing for horses, especially when wet or upon slopes.

"Warren's invention, briefly stated, consists in the discovery that an aggregate of large and small pieces of stone, together with a certain proportion of stone dust, all mixed together and thoroughly permeated with bitumen or ashphalt, results, when set, in a compact, stable structure; is less liable to disintegrate from traffic or weather than any other method of grading or arranging the mineral constituents. Under the evidence, the particles are more compact in their relation to each other and there is a minimum of friction in their interaction. The larger pieces of stone withstand the tendency of the small grains or dust to slip by each other and change the form of the pavement by disintegration and lumpy spots. The result is, therefore, a stability due to the arrangement of the mineral structure which enables the use of a softer ashphalt or bitumen than would be otherwise feasible, in as much as a greater proportion of the wear and strain is carried by the mineral elements than by the binding constituent. This is, in substance, stated and claimed as an advantage over any other pavement composition by the patentee in his specifications. The fundamental idea of Warren is not that the "density" of his composition gives the stability which he claims, but that the mineral aggregate should of itself resist displacement by traffic. Neither is the utility or intrinsic value of the Warren pavement seriously denied, though its superiority over the sheet ashphalt, under ordinary conditions, is by no means conceded. Aside from any sort of concession as to the utility and intrinsic value of the structure of the patent, its durability and practical value in use is established by a great volume of evidence coming from expert engineers acquainted with the pavement problem as well from others who speak from observation, of the pavement in use in many parts of the country. Its durability under traffic, its cleanliness, its noiselessness and freedom from undue slipperiness as compared to most other forms of pavement structure may be regarded as well established. Indeed the record of the proceedings below and the briefs and oral argument here have, in substance, reduced the case to the simple question of whether the invention of the patent had not been anticipated.

Imitation pavements laid under various names, "bituminous macadam," ashphalt macadam," ashphaltic concrete," mineral rubber pavement," etc., have been laid during the past few years in several cities in the East and in Southern California, all following the Warren claims practically in every detail, and the decision referred to above will block such imitations in the future, as cities would become liable for use of the patent without a license to do so. The patentees have wherever they have been requested to do so filed an agreement offering the use of the patents at a nominal royalty, and in all cases are willing to allow the use of their patents, and it is therefore unnecessary to infringe in order to secure the rough surface, durable pavement covered by them.

* * *

Figuratively Speaking

Statesmen in Washington are telling a story about Chief Justice Fuller. The chief justice, so the story runs, met an old-time friend, and after a hearty hand-clasp Mr. Fuller remarked,

"You are looking exceedingly well. Aren't you filling out a little?"

"No, indeed," replied the friend. "You probably think so because I'm looking Fuller in the face."

* * *

A cheerful lie makes more friends than a solemn truth.

Some Notable Steel Contracts of a Portland Industry



Reinforced Concrete Water Tower
Built by Northwest Bridge Works, Portland, Or.

MODERN requirements in construction work demand facilities far more extensive than those considered adequate a few years ago and today time of preparation and erection are largely the essential features of the contract.

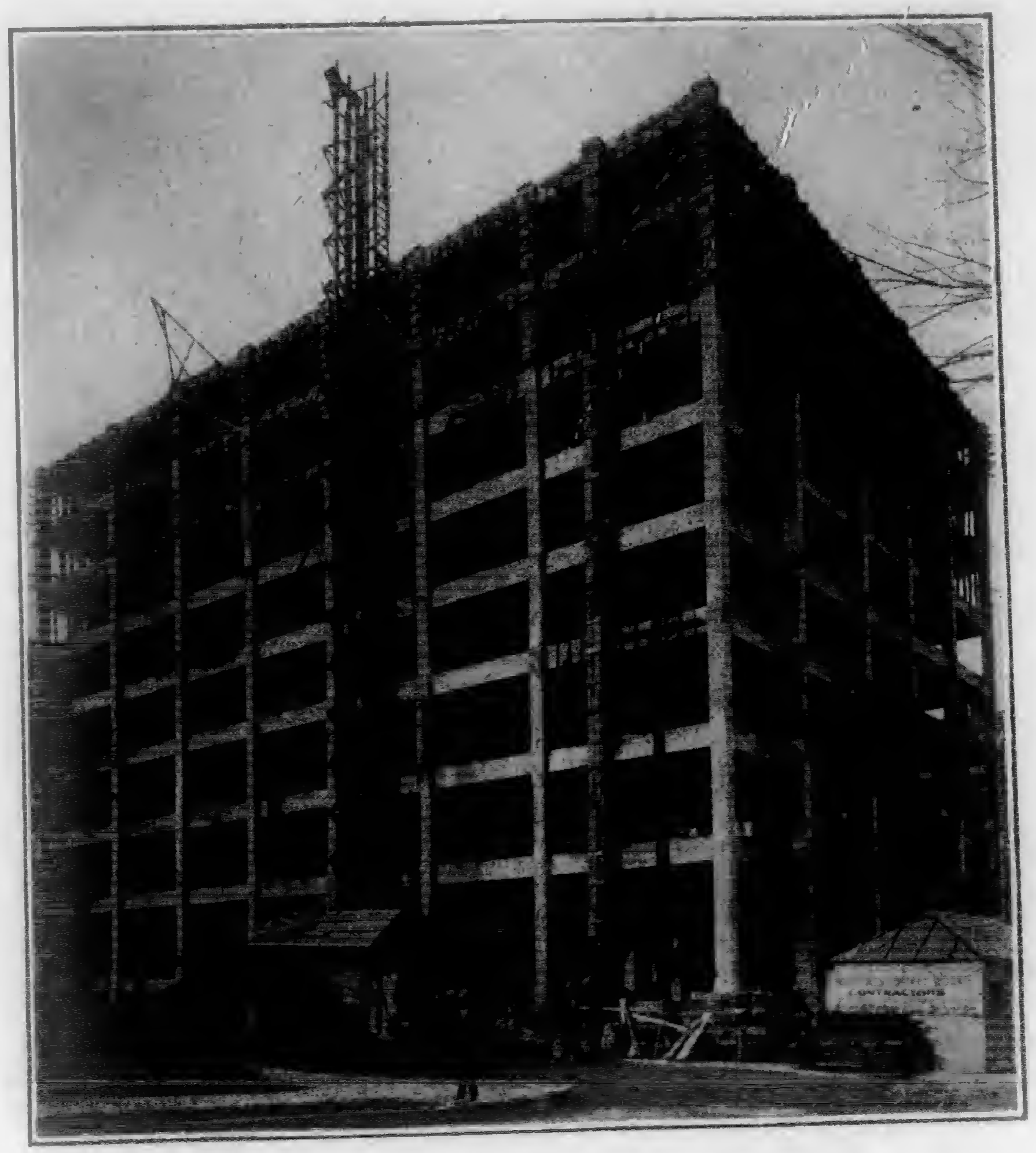
When the steel shops of the Northwest Bridge Works were first planned in 1902, steel beams, channels and angles — cut to length and possibly drilled—constituted the only output of the yards. Realizing the possibilities offered by the future to pioneers in advanced construction, the company decided to install a complete fabricating plant, consisting of the best and most approved types of machinery and handling devices. This was done in time to avail of the opportunity afforded by the San Francisco disaster, and as a result the steel frames of eighteen structures were manufactured in Portland and shipped to that and other California points.

Among the Portland contracts of the company are numbered the Corbett building, Failing building, Portland Commercial club, Rothchild building, Fenton building, 260-foot riveted span for P. R. L. & P. Co. over Clackamas river and a steel viaduct over Sullivan's Gulch at Union avenue for the city of Portland.

With the advent of 1908, reinforced concrete seemed to play a sufficiently important part in the construction world to warrant the installation of modern equipment and invasion of that field. The initial contract was the reinforced concrete viaduct for the city of Portland over Sullivan's Gulch at East Twenty-eighth street. This structure was completed in four and one-half months, although the contract permitted ten months for its construction, and has been pronounced by engineers of national reputation as one of the best pieces of reinforced concrete work on the coast. The length of the bridge is 558 feet, width 60 feet, height 42 feet.

Under construction are the Y. M. C. A. building, eight stories, 100x130; Labbe building, six stories, 100x100; Wilcox hotel, nine stories, 100x100; Portland public market and cold storage, two stories and basement, 200x200.

As in steel construction, the slogan of the concrete department is



Young Men's Christian Association Building, Portland, Or.
Northwest Bridge Works, Contractors *McNaughton, Raymond & Lawrence, Architects*

"Good work quickly done," and a striking example of dispatch is the Labbe building. The first floor was poured on October 3rd and the roof December 18th.

The Northwest Bridge Works control the celebrated Mushroom System, whereby concrete construction is made possible without the use of beams and girders. Economy of space under this system is great and it is also particularly adapted to heavy construction, columns having been designed and built to successfully carry 1000 tons live load.

The facilities of the company extend beyond mere framework construction, as they are prepared to contract for a completed building, ready for occupancy. A number of their San Francisco jobs were handled on this basis, as were the Rothchild and Labbe buildings in Portland.

* * *

When They Begin to Save

John M. Carrere, at a recent meeting of architects in New York city, made the following pertinent comment:

"Amazing, the age of an architect's patrons! The average man, in fact, is 35 before he begins to save seriously; his pile isn't made till he is 50; he begins to build himself a house in his old age, and his funeral takes place about the time the painters are called in."



Labbe Building, Portland, Or.
Northwest Bridge Works, Contractors — Bennes, Hendricks & Tobey, Architects

Painting Cement Surfaces

By P. W. NELSON.

IT is only in comparatively recent years that cement has come into more extensive use as a building material, and it is but natural that the majority of us are as yet undecided about how to proceed in the painting over cement because we have not had sufficient time in which to make our experiments, note the results and arrive at a positive conclusion. A great many experiments have, of course, been made, but most of them without a trace of scientific reasoning back of them. As an example, I will relate what an Eastern painting contractor told me recently in regard to painting on cement.

He said he always had more or less trouble with cement surfaces until he found a method which he could rely upon. His method was to give the surface a coat of strongly glued calcimine before applying the oil paint; this might have helped him out at the time, but it is certainly no method which can be safely recommended.

Many hastily conducted experiments have led to wrong conclusions, and it has even happened that two men, experimenting along the same lines, have come to opposite conclusions. The reason for this is that there is a difference in cement and cement surfaces, and our aim is to find, if possible, a method which will give satisfactory results in all cases.

It has long been the popular opinion that linseed oil is hurtful to cement, and also that no oil paint would endure if applied direct to the cement. I believe both of these opinions to be wrong.

One of the foremost authorities on cement assures me that he has been painting with oil paint over cement for many years with the best results.



Illustrating the Mushroom System of Reinforced Concrete Used in the Labbe Building
Northwest Bridge Works, Contractors

It is true, however, that all non-drying oils are more or less destructive to the cement, and if the cement wall should be saturated with raw linseed oil there is no doubt about the outcome, as the oil would slowly disintegrate the cement. But for painting we do not use non-drying oil, and our oil paint will dry on the surface without affecting the cement, a fact which has been fully demonstrated. As for the cement affecting the oil paint, so is that more apparent than real. It is held by experts that cement surfaces properly executed clean and dry, are no more dangerous to oil paint than the modern wall plasters.

Undoubtedly most of the trouble is caused by the painting being done before the cement is dry. Cement dries very slowly. The opinion of men who are experts in the use of cement say that a cement wall must stand at the very least over one summer before painting with oil paint can be commenced.

The first thing required is to wash the surface thoroughly with a weak solution of muriatic acid, followed with a good wash of clean water. The strength of the acid solution should be about 7 or 8 per cent. This wash will clean the surface, neutralize to a large extent the alkali, and thus make on the smooth cement surface enough of an impression to give the paint a proper hold. The surface must then be given time to dry perfectly.

In painting it is well to use considerable more turpentine than is ordinarily the case, and very little dryers. In fact, boiled linseed oil is considered preferable to raw. For priming, the paint should be used thin, and contain so much



Ornamental Ceiling in the Home Telephone Building, San Francisco
Executed by D. Ross Clark *Coxhead & Coxhead, Architects*

turpentine that it is almost flat, increasing the amount of oil for succeeding coats. Each coat must be given ample time to dry before the next one is applied.

For water color or calcimine, washing with muriatic acid solution, followed by clean water, should be done if first-class work is to be expected. When the surface is thoroughly dry it should be given a coat of alum size, or, still better, a coat of flat paint, and when the size is dry the surface is ready for calcimining.

One painting contractor, who does a great amount of work in our Eastern sky-scrapers, tells me that he makes a size of equal parts of acetic acid and alum. His formula is one pound of acid, one pound of alum and two gallons of water. I have not tried this size, so I give it for what it is worth.

If the treatment suggested should prove not to be all we expect, it is at least the best I have, through diligent search, been able to obtain, and one that I believe is the best so far put forward.

So far so good, but in this method there is one thing which nearly everybody is opposed to using in paint nowadays, namely, time. Time is the great sesame for all painting. Give the surface time to dry and let one coat dry thoroughly before another is applied, and we will have far better work than is usually the case.

In our modern rush the painter is, however, often forced, against his protest, to paint over a surface long before it is dry enough to receive the paint. This is true not only of cement, but also of plaster and sand finish. We all know there will be trouble when painting is done over a wet surface, and with cement the main difficulty is that it dries so very, very slowly that it is invariably painted before it is half dry. It may appear dry on the surface and still contain a large quantity of moisture.

To meet this demand for rush, inventive minds have set to work to make a paint which can be applied over cement as well as plaster surfaces



Family Club Building, San Francisco
C. A. Meussdorffer, Architect

while the same are still damp. There are a few such paints on the market today; some are manufactured in paste form to be thinned down with turpentine and benzine. They dry out perfectly flat, have great covering power and will adhere to the damp cement or plaster by virtue of the fact that they will permit the moisture in the wall to evaporate through.

It must be plainly understood that ordinary oil paint or enamel cannot be applied over them until the wall is thoroughly dry, because such coating will close up the pores of the wall, so to speak, prevent the moisture from escaping, and force it to accumulate behind the paint, causing the paint to blister and come off.

* * *

Should Architects Sign Their Work?

By JAMES W. REID, of Reid Bros., Architects.

Replying to your favor asking for an expression of opinion as to whether architects should sign their work:

There would seem to be no good reason why this should not be done. Such conspicuous assumption of responsibility by the author would, perhaps, tend to more careful and studious design, and this would apply to every class of architectural work.

Yours very truly,
JAMES W. REID.



Residence of Mr. Adolph Uhl, Piedmont, Cal. Albert Farr, Architect

Landscape Architecture

By LOUIS F. HORNER.*

LANDSCAPE architecture may justly be considered one of the fine arts. The choicest perceptions of forms and colors, the just gradations of objects and their most advantageous combinations, require artistic instincts of the highest order.

Pictures have to be created through the medium of the living forms of nature, instead of imitating the resources of pictorial art; not only is the imitative faculty called forth in reproducing prominent features of natural scenery, but also the creative in developing beauty where it lies dormant and heightening it where it is only partially displayed.

The great landscape architects, who have from time to time revolutionized the horticultural tastes of their age, deserve to hold a high place amongst the improvers of public tastes. The circles influenced by their teachings are wider than those of either sculptor or painter. Hence, the improvement of our great public parks and noble private domains, which has extended to the more unpretentious premises of those who possess such humble plots as the diminutive forecourt or small garden attached to the smallest suburban cottages, is not a little owing to their influence and teachings.

Of late years there has been a decided advance in the style of embellishment adopted in the generality of our gardens. In Southern California there is a lamentable neglect or abuse of the numerous beautiful objects of the various families of plant life.

There is no defined zone on the face of God's earth where such a great variety of the vegetable kingdom grow nearer to perfection than right here in this beautiful Southland. It is the blending zone, as it were, where plants from the Arctic regions flourish side by side with those from the desert of the Sahara. Hence the necessity of studying the style of architecture and its adaptability to the topography, the color, size, form of the various members of the vegetable kingdom and the correct uses and exposures to which they are adapted.

*Mr. Horner is associated with Wilbur David Cook, landscape architect, of Los Angeles. The several illustrations of Architect Albert Farr's work, accompanying this paper, have no direct connection with Mr. Horner's article further than to show the attractive and picturesque results that can be accomplished by an artistic combination of trees, shrubs or plants.



Rustic Aviary, Estate of Mr. Adolph Uhl, Piedmont, Cal.
Albert Farr, Architect



Garage of Mr. Adolph Uhl, Piedmont, Cal.
Albert Farr, Architect



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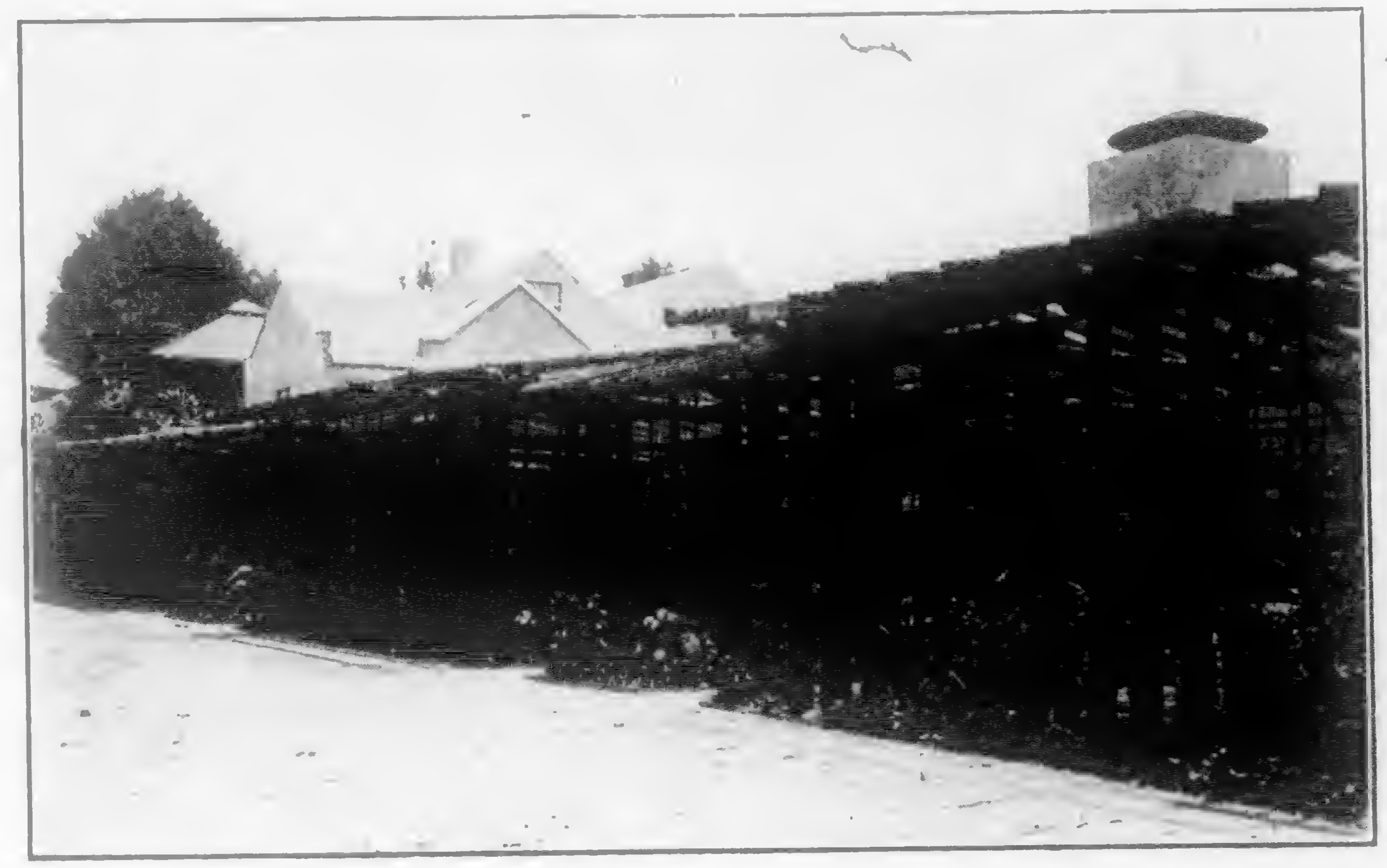
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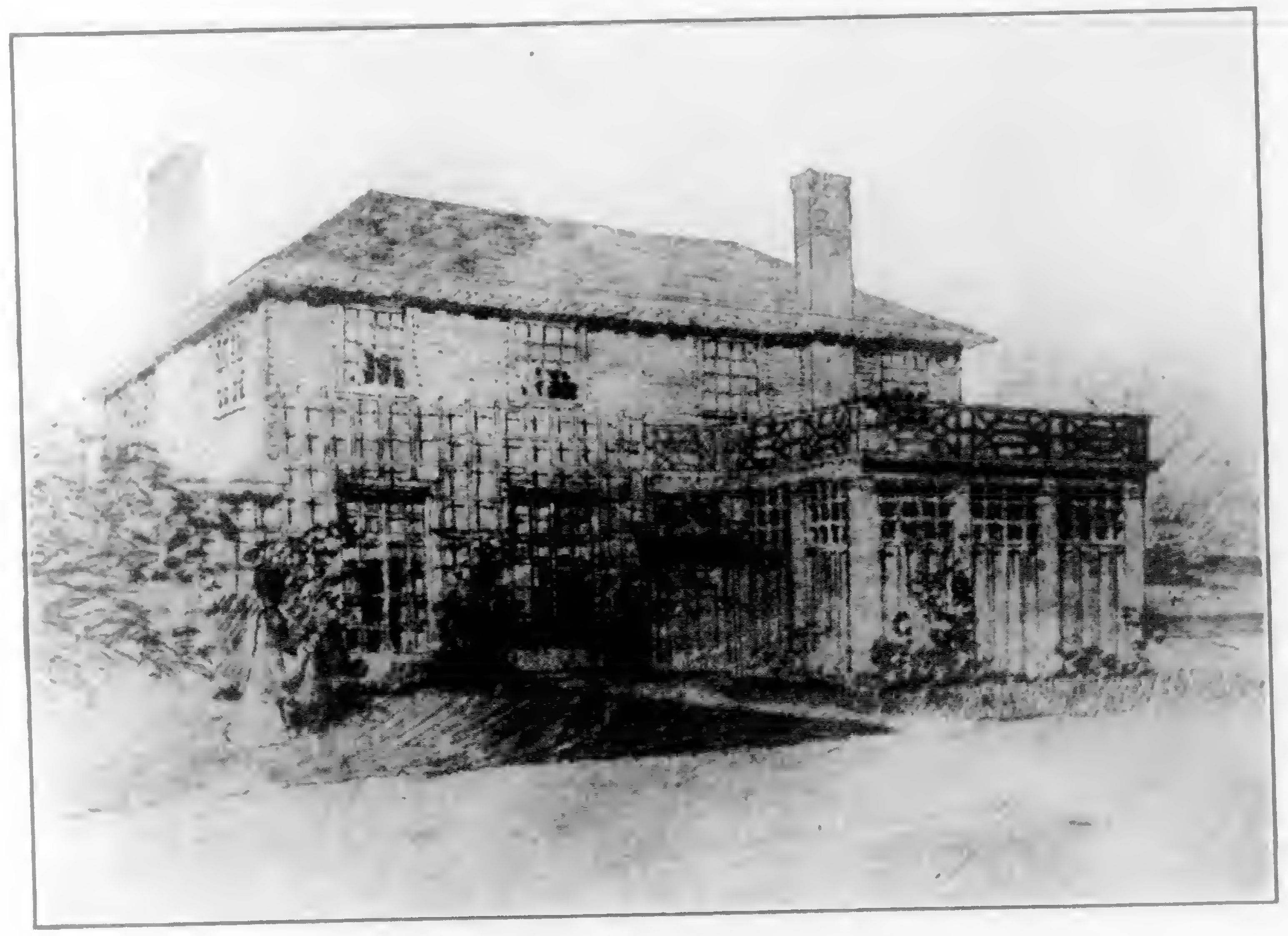
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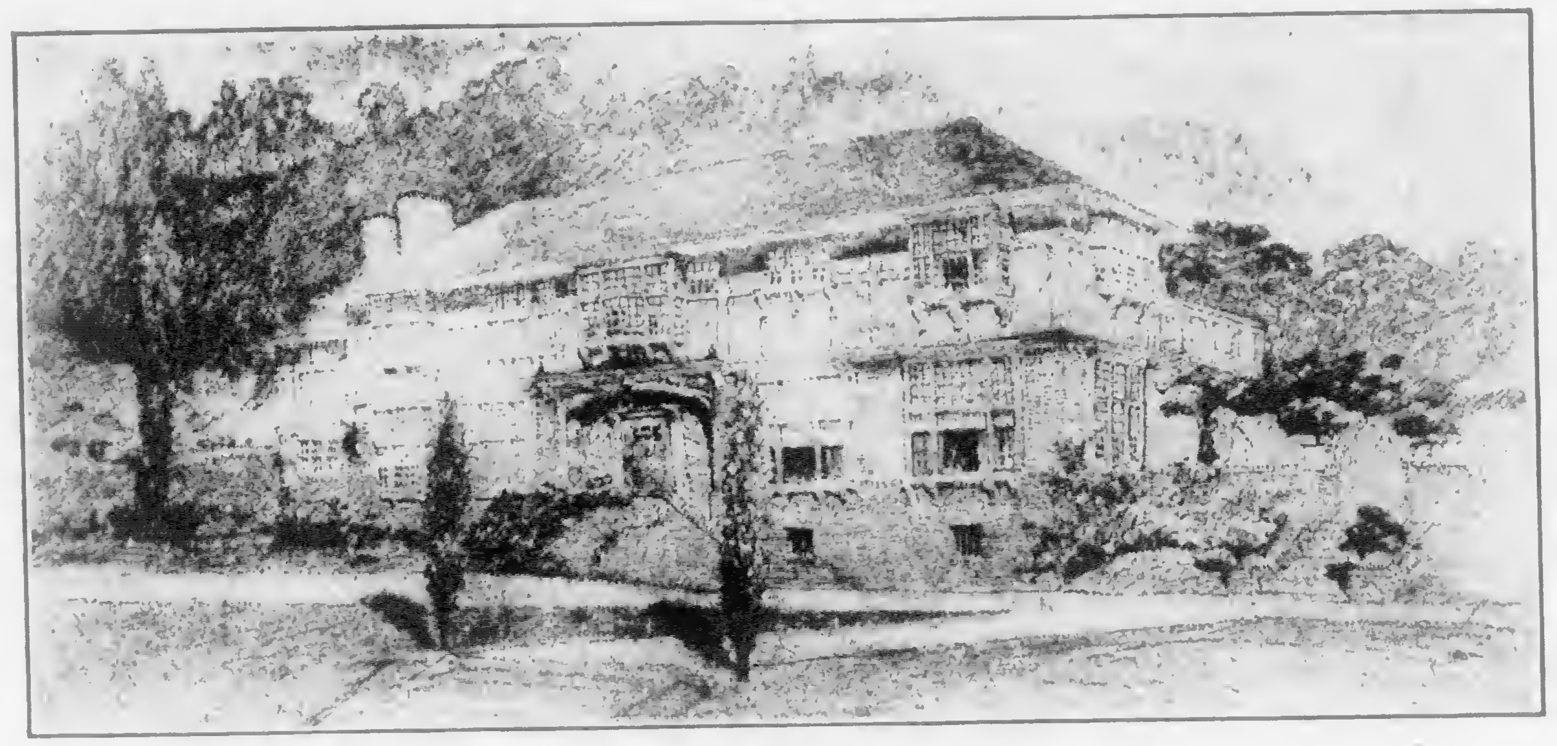
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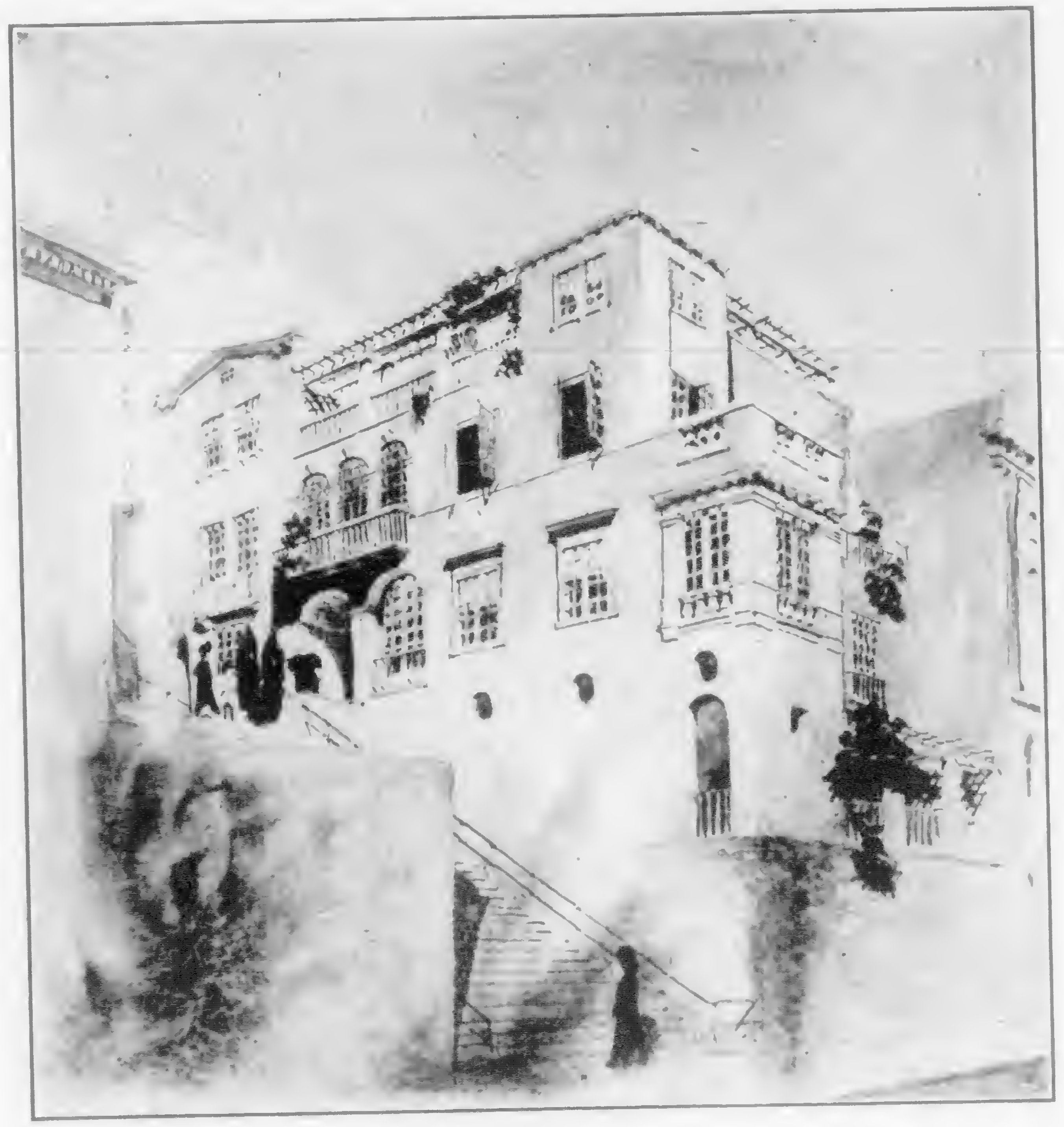
House of Mr. Walter Dole, Easton, Cal.
Albert Farr, Architect



Residence of Mr. More Sims, Claremont, Cal.
Albert Farr, Architect



Residence of Mr. Herbert Brown, Piedmont, Cal.
Albert Farr, Architect



Apartment Flats for Mr. W. A. Richardson, San Francisco
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An artistic combination of trees, shrubs or plants is too rarely seen. An artistic combination of forms will always be attractive, as there is at all times variety to relieve and please the eye; harmony and contrast equally subserve to this end, whether the effect be produced by form or color.

It would be a mistake to suppose that Landscape Architecture is confined merely to designs of a large scale. Its principles should be as much observed relatively on the smallest place.

The average client selects his architect, usually with care and excellent judgment, taking pains to ascertain the architect's ability to secure the desired results, knowing that the completed structure will, to a certain extent, be a reflection of his personality and taste, the interior of the house being open to the inspection of his home circle and guests. Too few exercise the same good judgment in the selection of a man to develop their grounds, which are open to the inspection and criticism of every passer-by, and glaring defects of landscape design testify to lack of good judgment in this respect. The above is one of the most serious errors which can be made, as it takes years for the plantations to fulfill the mission for which they were originally planned.

It will not be possible to enter into an extended discussion of this subject here, but there are a few principles which one should not lose sight of, who wishes to plant his garden well. First, there must be some distinctive feature to which other considerations must be subordinate. This feature may be dependent on some natural circumstances; it may be a fancy or hobby of the owner.

In order to secure the best results on an estate of any size, where the topography is diversified in character, it is absolutely essential to first secure a survey of the existing contours, as this information is the very foundation on which the entire landscape scheme is developed.

First of all, the existing topography, together with view, determines the location and elevation of the house. This survey should be made from specifications furnished by the landscape architect, as the ordinary survey does not embody the information so absolutely essential in the development of the work.

This survey of existing contours is used as a basis for all subsequent work, this same survey giving the architect all the necessary data called for in his work.

With such comprehensive information in his possession, there is no uncertainty relative to the amount of work to be accomplished. With his finished design worked out from these data, the landscape architect is then in a position to inform his client of the amount of cuts or fills and the approximate cost of the same.

The necessity of sometimes going to a great distance and hauling hundreds of cubic yards of material to complete the work is obviated.

Every grade is established for every finished contour, walk, steps or drain. Every tree or shrub is located as an individual, and with regard to the relation they bear to the grounds as a whole, and, in their matured state, the position they occupy in finishing out the prearranged picture.

With such a comprehensive plan to work from, even if the owner intends to execute only a portion of the work each year, in the end when his work is completed he has a unified result that is worth while, and at the utmost economy of expense.

It should always be borne in mind that from the moment the architect completes his work, when he has laid his last brick in place and placed the finishing touches on his building, that work commences at once to

decay. Not so with the landscape architect; Nature goes on year after year, building on to the foundation and developing up the picture along the lines laid down by the student of the landscape art, years before.

The greatest mistake made in laying out an estate is attempting too much.

Kingdoms and republics, architecture and style may change, but Nature goes on, year after year, rounding out and completing results planned for generations before.

Whatever is worth growing is worth growing well. Study your soil and exposure and use plants demanded by such conditions.

Cultivate no more space than you can maintain in perfect order.

Avoid stiffness or exact balancing, except where the treatment demands it.

* * *

Wanted—A Fireproof Roof

(From a paper by T. J. A. TIEDEMANN, Insurance Expert.)

A POTENT factor in increasing the extent of, and damage done by, fires in the United States, is the existence of such a large per cent of defectively constructed and non-fire-resisting roofs. That the rapid spread of the fire in San Francisco in April, 1906, was due in a great measure to this cause, I do not hesitate to say. On that occasion I crossed each day from Alameda to San Francisco, and being inside the fire zone, I had every opportunity of watching the progress of the flames, and making such mental and written notes as I desired. In the cases of the brick buildings with inferior roofs and unprotected skylights, the structures seemed to suddenly collapse and melt out of existence, as it were, apparently before the onrushing flames had attacked them. Explanation of this is that the roofs had taken fire from falling burning brands, or the terrific heat, and in this manner became furnaces within their walls, and were thus practically destroyed before the fire itself actually reached them. I recall a similar experience in Seattle, when from different points of vantage on Third avenue I watched the destruction of the business portion of that city in 1889. In this conflagration it seemed as if the brick buildings were demolished in less time than were the frame structures. With this, and the later experience in the San Francisco fire, as examples of the hazards of buildings with inferior roofs, unprotected skylights, etc., it should behoove us to use our utmost endeavors to prohibit for all time the construction of such roofs, particularly in San Francisco, where such a golden opportunity exists for restoring the city with buildings of modern type and fire-resisting qualities. With our experiences as object lessons, we have everything to forcibly impress upon us the wisdom of action being taken to prevent, to as great a degree as we can, the possibility, through faulty construction, of a recurrence of a catastrophe such as devastated the city of San Francisco.

* * *

There's A Reason

Little grains of sawdust, little strips of wood, treated scientifically, make the breakfast food.—Toledo Blade.

* * *

Study men and learn what they are doing and what they are capable of, then when you want a man for a special appointment you will know where to put your hand on him.

THE AMERICAN INSTITUTE OF ARCHITECTS.

OFFICES, THE OCTAGON.

CASS GILBERT, *President.*
R. A. CRAM, *1st Vice-President.*
IRWIN K. POND, *2d Vice-President.*
GLENN BROWN, *Secretary and Treasurer.*

WASHINGTON, D. C.

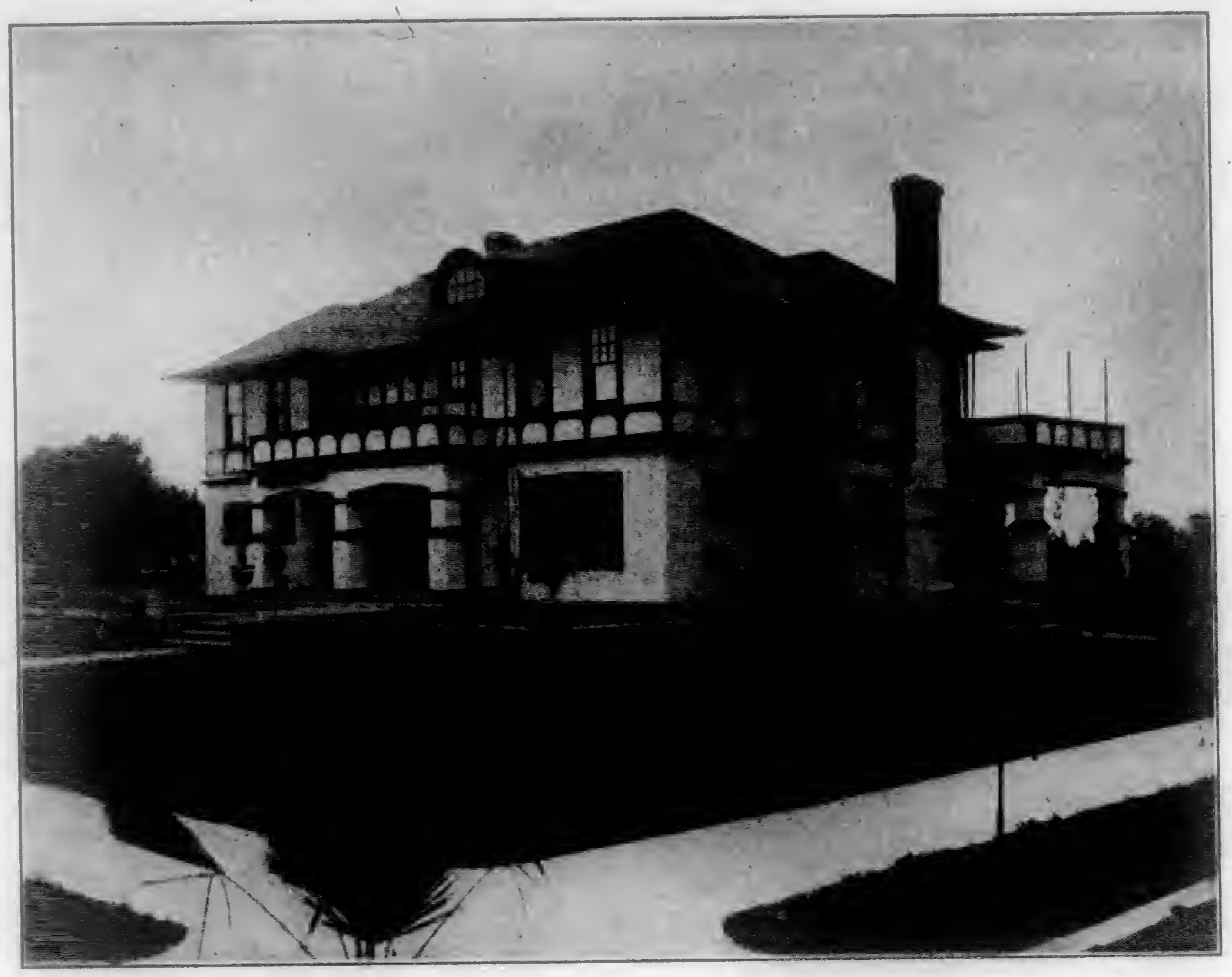
A CHANGE IN THE SCHEDULE OF CHARGES BY THE AMERICAN INSTITUTE OF ARCHITECTS, DECEMBER 15, 1908.

While the remuneration of the architect has not advanced during the past forty years, the cost of production, office expenses and draughtmen's salaries have nearly doubled. Proper equipment requires a longer preparation and a more thorough education, and the responsibility of the architect has been enormously increased by the requirements of the modern structure with its engineering, mechanical and electrical equipment. The old charge of five per cent continued in vogue for forty years.

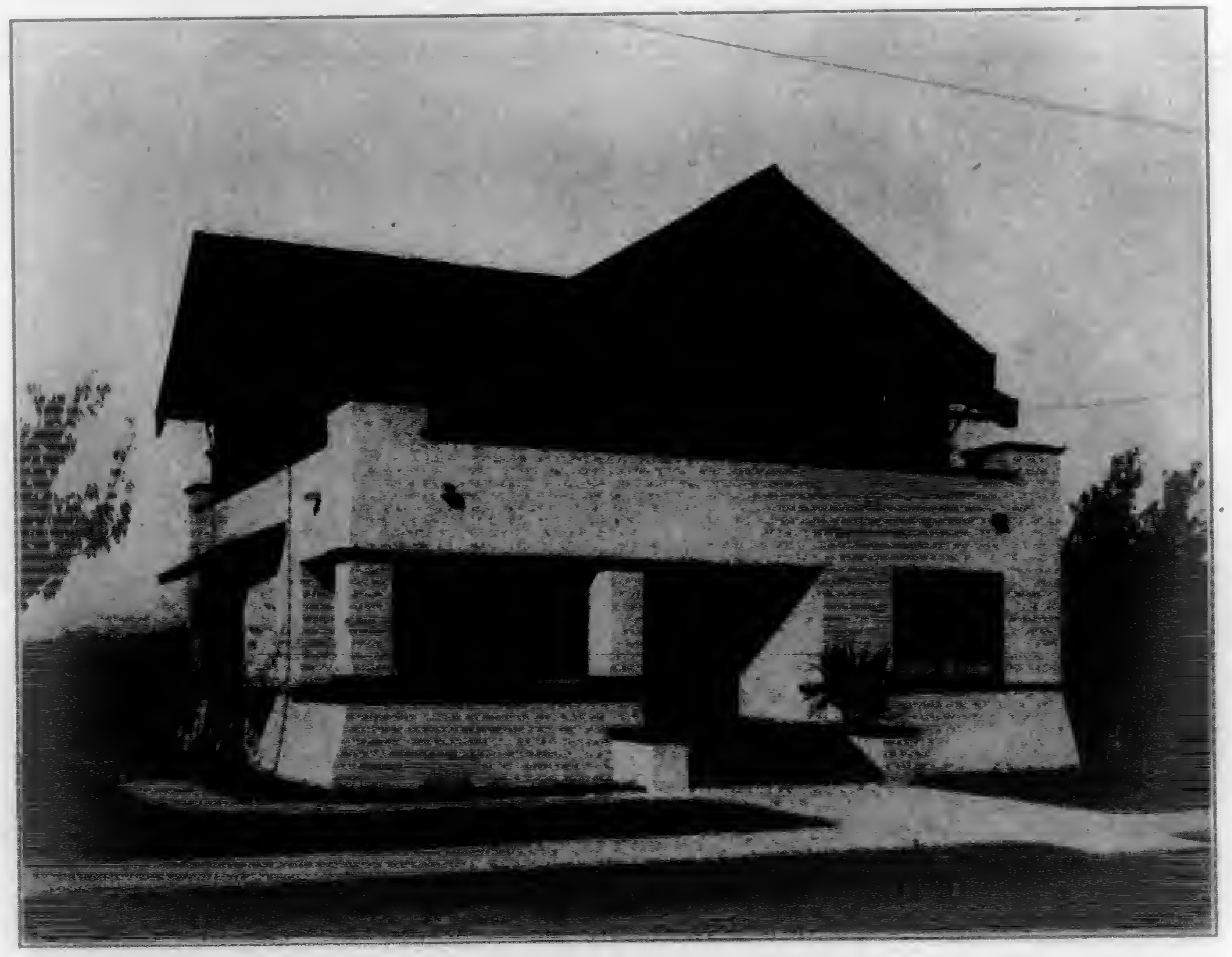
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GLENN BROWN,
Secretary.

EDITOR'S NOTE.—The schedule in full appears on page 84, this number of The Architect and Engineer.



Two Story Plaster Exterior House, San Jose
Wolfe & McKenzie, Architects



Combination Plaster and Shingle House
Wolfe & McKenzie, Architects

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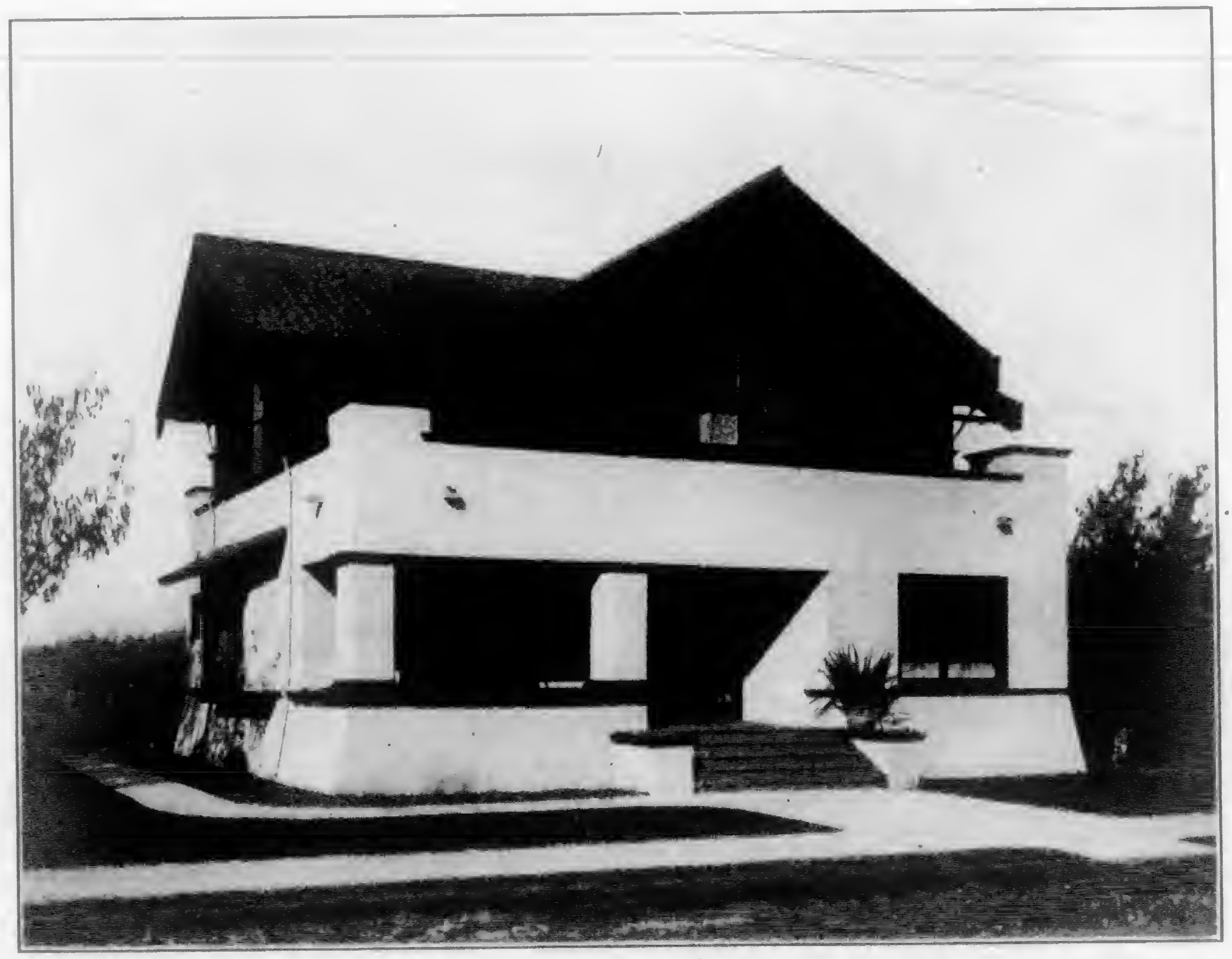
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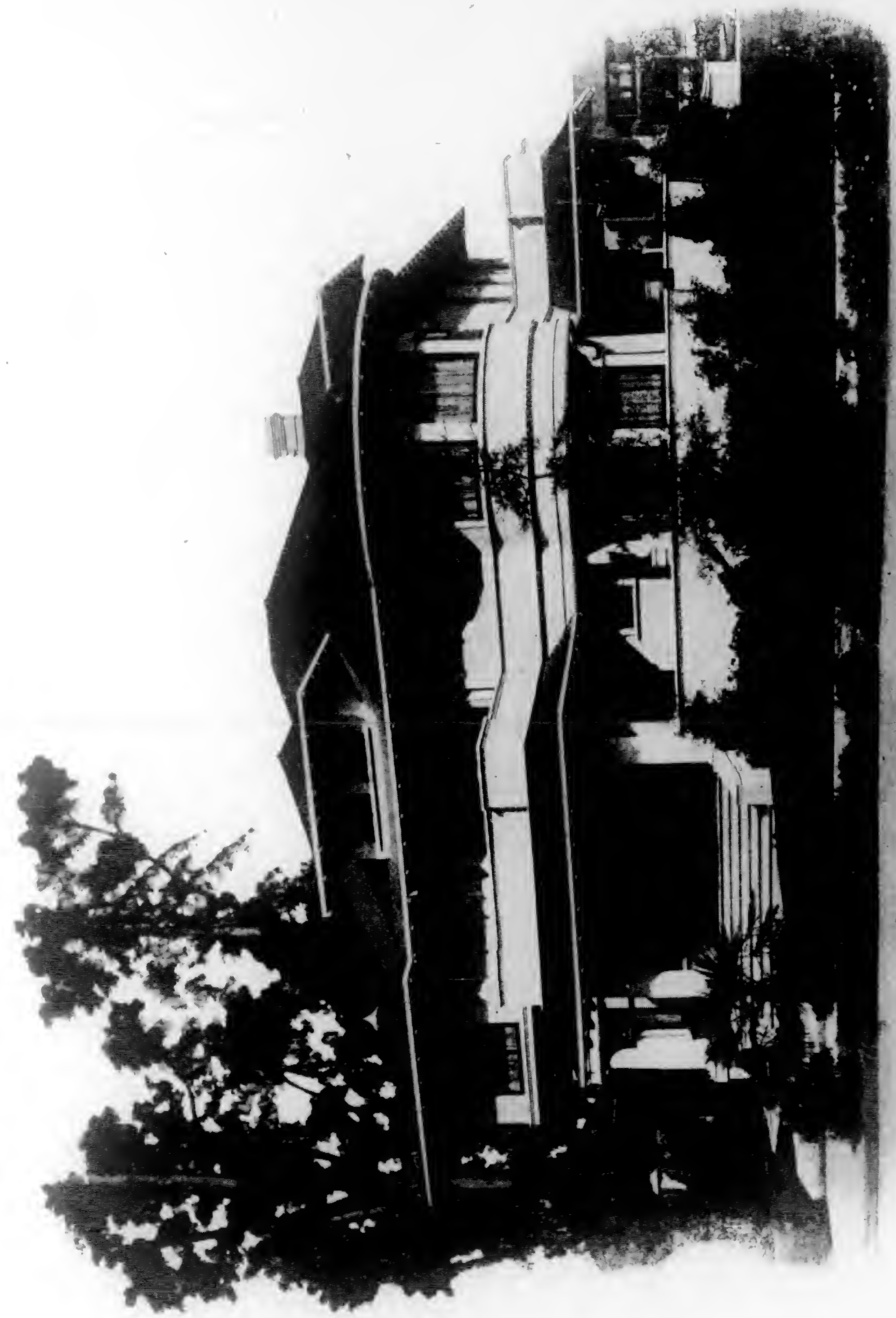
EDITOR'S NOTE.—The schedule in full appears on page 84, this number of The Architect and Engineer.



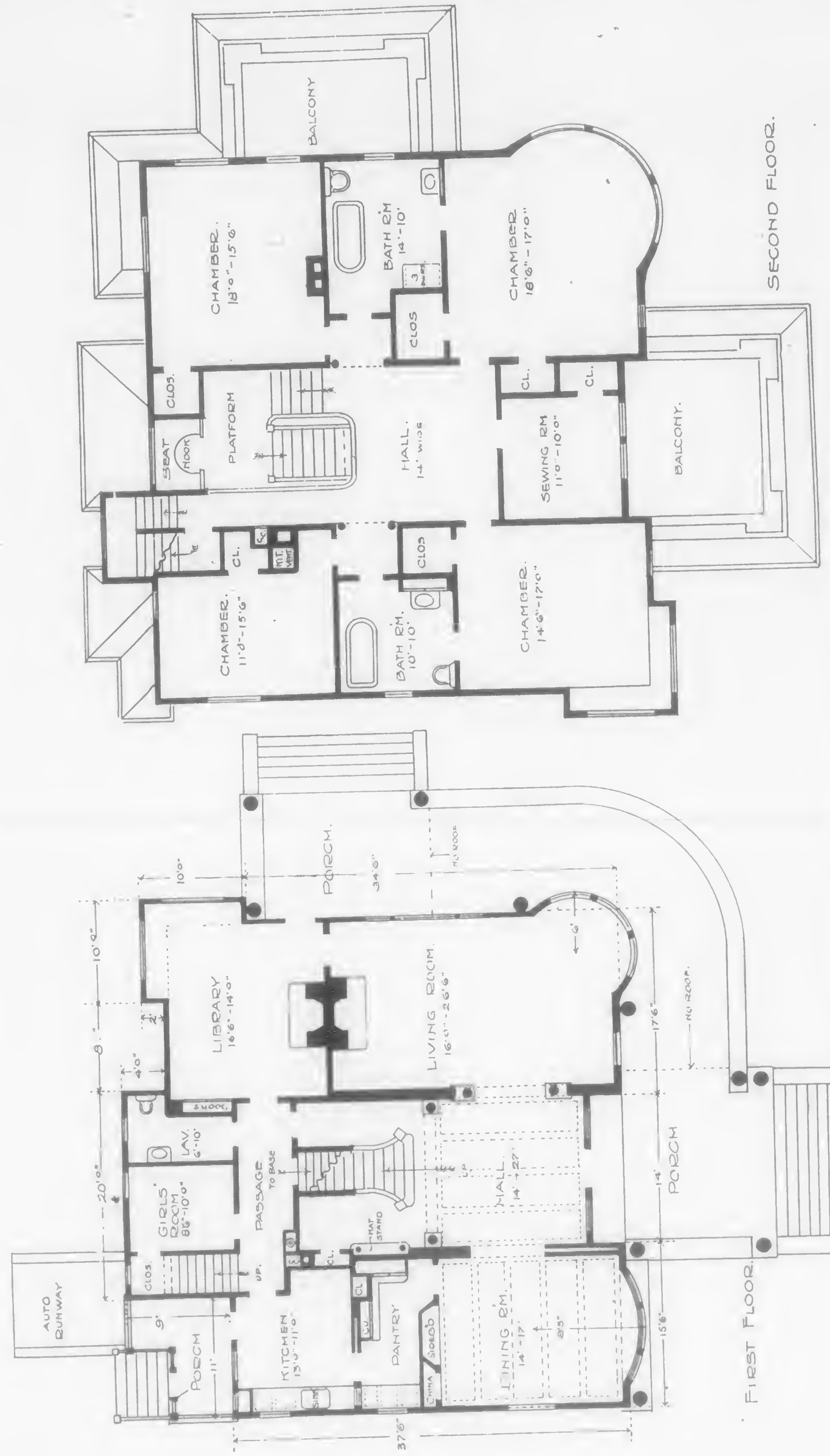
Two Story Plaster Exterior House, San Jose
Wolfe & McKenzie, Architects



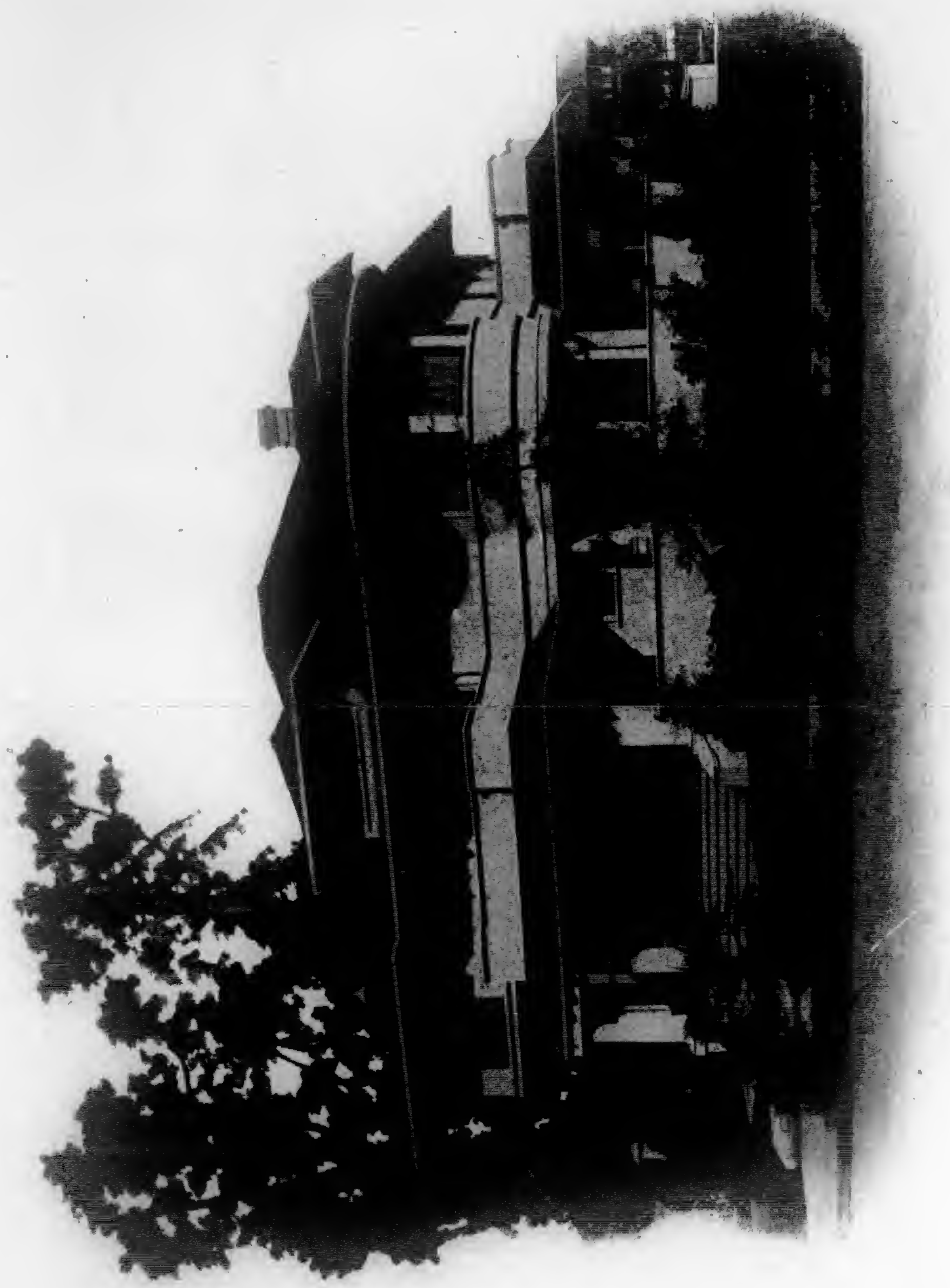
Combination Plaster and Shingle House
Wolfe & McKenzie, Architects



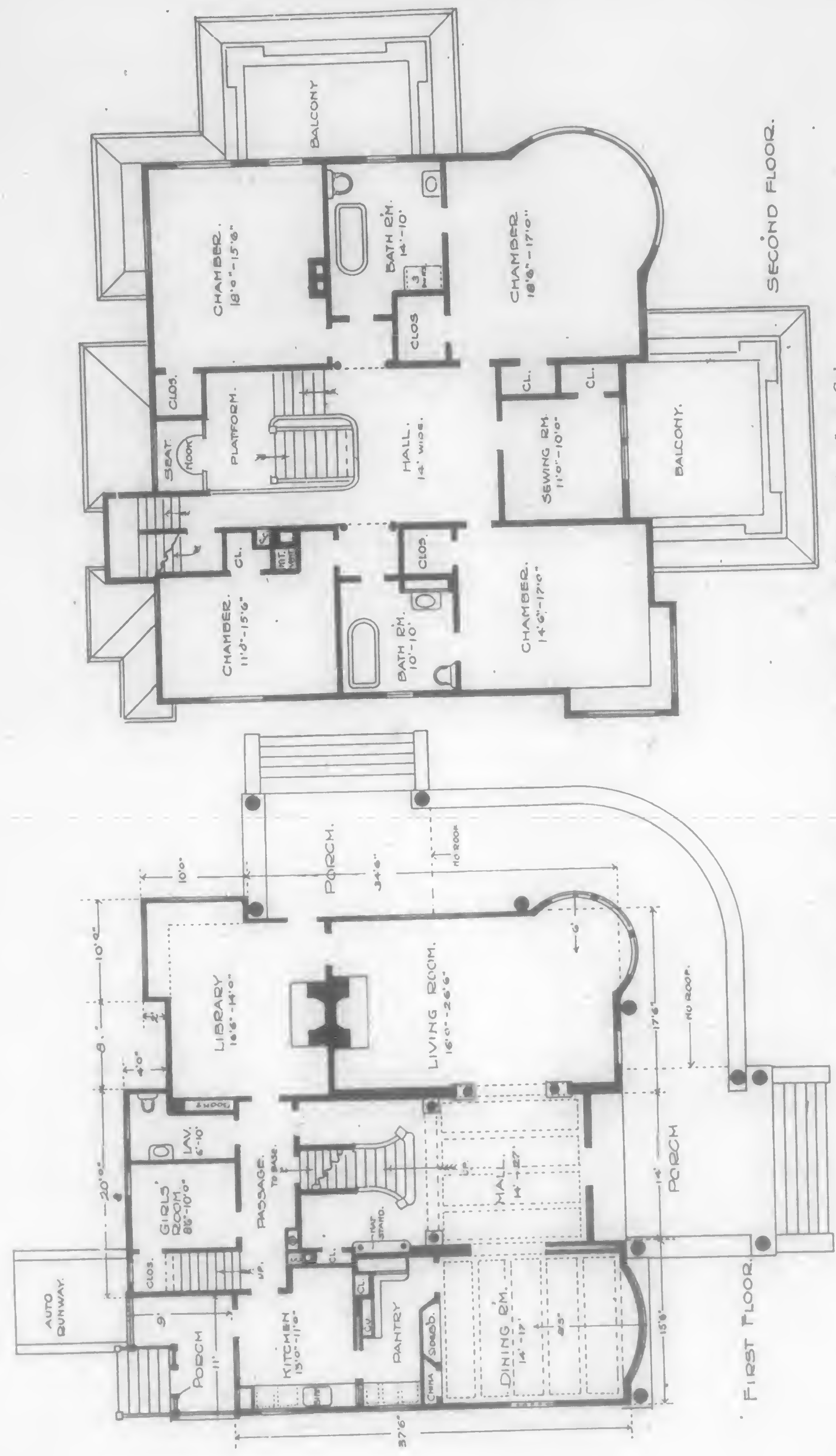
Residence of Mr. George N. Herbert, San Jose
Wolfe & McKenzie, Architects



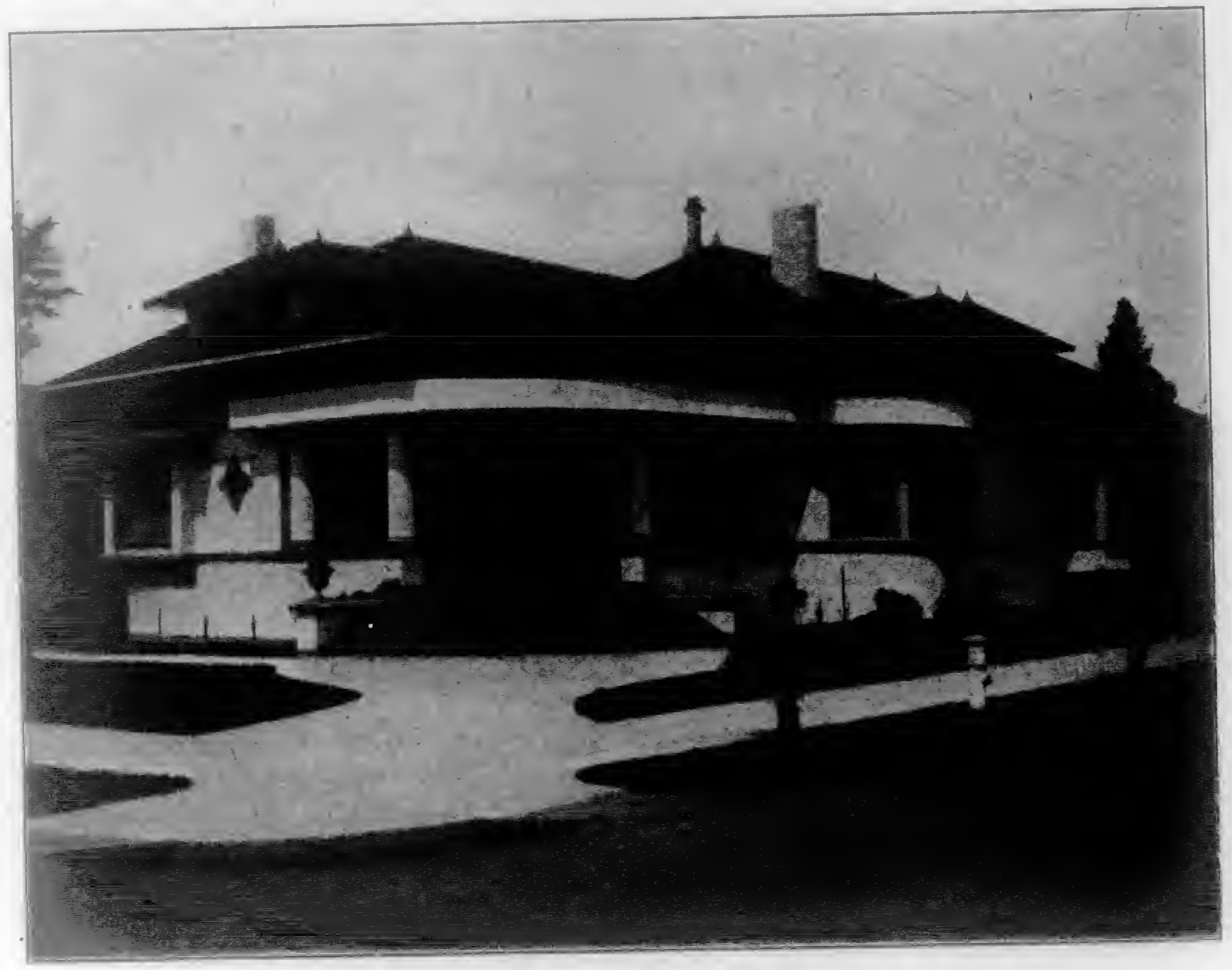
First and Second Floor Plans, Residence of Mr. George N. Herbert, San Jose, Cal.



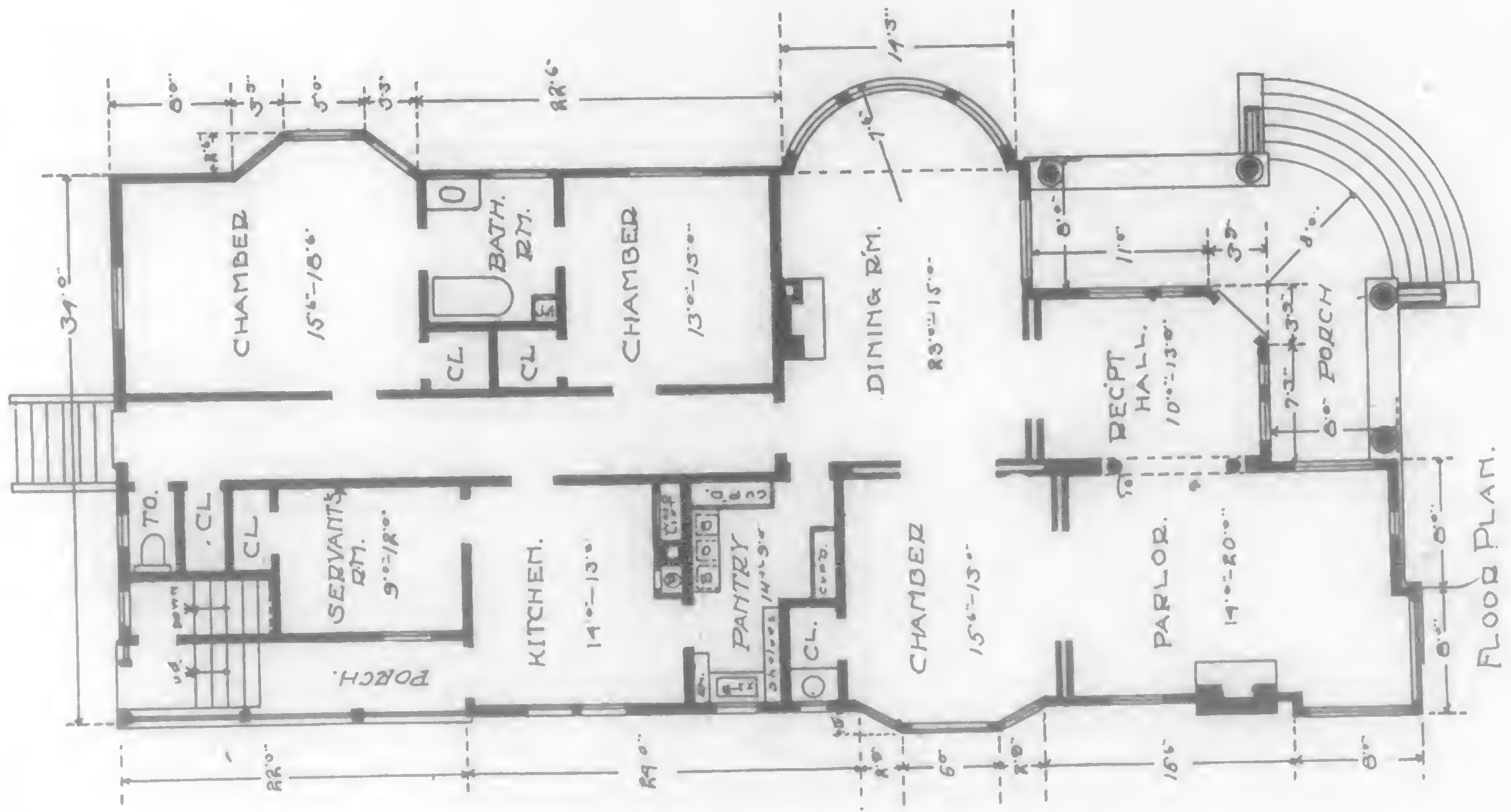
Residence of Mr. George N. Herbert, San Jose
Wolfe & McKenzie, Architects



First and Second Floor Plans, Residence of Mr. George N. Herbert, San Jose, Cal.



House of Mr. Harry Bercovich, San Jose
Wolfe & McKenzie, Architects



Floor Plan, House of Henry Bercovich, San Jose

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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TREASURER........................J. F. EVERETT

Portland Architectural Firm

Edgar M. Lazarus, Morris H. Whitehouse and J. Andre Fouilhoux have formed a partnership under the firm name Lazarus, Whitehouse & Fouilhoux, with offices in the Lumbermen's building, Portland, Or.

Edgar M. Lazarus is a graduate of the architectural division of the Maryland Institute of Fine Arts, taking the first Peabody premium. He is also a Fellow of the American Institute of Architects.

Morris H. Whitehouse, a son of B. G. Whitehouse, a pioneer family of distinction, is a graduate of the Massachusetts Institute of Technology.

J. A. Fouilhoux, whose specialty is structural steel and reinforced concrete work, will have charge of the enginering branch of the firm; he is a graduate of the Ecole Centrale des Arts and Manufactures of Paris.

Architects Must Have Certificates

THE decision rendered at Los Angeles last month by Superior Judge F. R. Willis in the case of Otto H. Neher, for practicing architecture without having obtained a certificate from the State Board of Architecture, is of exceptional interest to the profession. The case was originally heard before Judge Rose in the police court in July, 1908. The defendant was found guilty and fined $50. He took an appeal to the Superior Court, and the decision rendered by Judge Willis was the result. Pending the outcome of the present case, Mr. Neher took the prescribed examination before the State Board of Architecture and was awarded a certificate. The decision, however, conclusively establishes the right of the State Board to prosecute all architects who do not hold the proper certificate, and assures the constitutionality of the law.

Mr. Neher was represented by Attornies W. F. Haas and C. S. Burwell, who declared the act calling for the certificate unconstitutional; that it had no uniform operation and that it granted special privileges.

Willis J. Morrison, attorney for the State Board of Architecture, prosecuted the case. He declared that the action was brought chiefly to test the constitutionality of the law, and since that had been decided, not only here, but in a similar case brought in San Francisco, the board would proceed to prosecute all persons practicing without certificates.

The decision of the court is far reaching, inasmuch as on it depended the final outcome of legislation appointing a state board in the state of New York, where architects heretofore have been unlicensed. The only other states in which there are boards of architecture are Illinois, New Jersey, and New Hampshire. The State of Washington is also contemplating a similar law.

The punishment in California for violation of the law is very severe, being a fine of not less than $50 or 50 days, and not more than $500 or 500 days. The law does not prevent any person from making his own plans or collecting data for his own building, or even for the buildings of others, provided he does not advertise himself as an architect. Nor does it exclude architects of other states from practicing in California, if they can furnish sufficient evidence of their competency.

It is held that architects are in a profession which has a great deal to do with human safety, and that they should therefore be licensed in the same manner as physicians, attorneys and dentists. There are boards for these professions in nearly every state, and it is a criminal offense to practice medicine, dentistry or law without a certificate.

Reputable architects are in favor of the law, since it prevents persons who have not had sufficient training from establishing themselves in the profession.

Architect Morgan's Views

Octavius Morgan of Los Angeles, a member of the California State Board of Architecture for the Southern District, speaking of the examination required of applicants for state certificates, says:

"The test is not severe, but it embodies essentials in which every man, who would properly construct a building, must be versed. The applicant for a certificate must be up on construction, design, mechanics, plumbing, electricity and a history of architecture of the past, with achievements of the present; also rendering estimates and supervision. There have been few failures since the board was placed in operation in 1903.

"For some reason, the work of eradicating the incompetent architects has never been taken up spiritedly until the last year. We have been waiting for the final assurance of the higher courts that the law is constitutional; and, having found that it is, we shall now go ahead and prosecute any man who publicly advertises himself as an architect, but who does not hold a license.

"In this way the citizens of the communities of California will be assured of a higher class of buildings.

"The board is not at all a political organization, but is composed of practical architects, who are competent to judge of the merits of the examination papers of an applicant. The laws enacted are not only for those who are regulated by them, but for the benefit of the greater majority whom they must serve. There has never been a time when the state board has defined the limitations of architecture, but it is merely to protect the public from the incompetence of those not fitted for the profession."

Pass Examination

At the last meeting of the State Board of Architecture for the Southern District, held in Los Angeles, the following applicants passed a satisfactory examination and were granted certificates:

Paul J. Van Trees, City National Bank building; Elmore R. Jeffery, City National Bank building; Walter E. Erkes, 415 Henne building; Paul F. Higgs, Pomona; Arthur H. Memmler, San Gabriel.

Professional Practice of Architects and Schedule of Proper Minimum Charges

THE American Institute of Architects at the Washington convention last December adopted the following revised schedule of minimum charges for professional services:

1. The architect's professional services consist of the necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings, and of the general direction and supervision of the work, for which, except as hereinafter mentioned, the minimum charge, based upon the total cost of the work complete, is 6 per cent.

2. On residential work, on alterations to existing buildings, on monuments, furniture, decorative and cabinet work and landscape architecture, it is proper to make a higher charge than above indicated.

3. The architect is entitled to compensation for articles purchased under his direction, even though not designed by him.

4. If an operation is conducted under separate contracts, rather than under a general contract, it is proper to charge a special fee in addition to the charges mentioned elsewhere in this schedule.

5. Where the architect is not otherwise retained, consultation fees for professional advice are to be paid in proportion to the importance of the questions involved and services rendered.

6. Where heating, ventilating, mechanical, structural, electrical and sanitary problems are of such a nature as to require the services of a specialist, the owner is to pay for such services. Chemical and mechanical tests and surveys, when required, are to be paid for by the owner.

7. Necessary traveling expenses are to be paid by the owner.

8. If, after a definite scheme has been approved, changes in drawings, specifications or other documents are required by the owner; or if the architect be put to extra labor or expense by the delinquency or insolvency of a contractor, the architect shall be paid for such additional services and expense.

9. Payments to the architect are due as his work progresses in the following order: Upon completion of the preliminary studies, one-fifth of the entire fee; upon completion of specifications and general working drawings (exclusive of details), two-fifths additional, the remainder being due from time to time in proportion to the amount of service rendered. Until an actual estimate is received, charges are based upon the proposed cost of the work, and payments received are on account of the entire fee.

10. In case of the abandonment or suspension of the work, the basis of settlement is to be as follows: For preliminary studies, a fee in accordance with the character and magnitude of the work; for preliminary studies, specifications and general working drawings (exclusive of details), three-fifths of the fee for complete services.

11. The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk-of-the-works or superintendent of construction) means such inspection by the architect or his deputy, of work in studios and shops or a building or other work in process of erection, completion or alteration, as he finds necessary to ascertain whether it is being executed in general conformity with his drawings and specifications or directions. He has authority to reject any part of the work which does not so conform and to order its removal and reconstruction. He has authority to act in emergencies that may arise in the course of construction, to order necessary changes and to define the intent and meaning of the drawings and specifications. On operations where a clerk-of-the-works or superintendent of construction is required, the architect shall employ such assistance at the owner's expense.

12. Drawings and specifications, as instruments of service, are the property of the architect.

Architects Honored

Archietcts A. F. Rosenheim, Los Angeles, and Bliss and Faville, San Francisco, were among the eighteen architects asked to submit designs and floor plans for the new Denver Federal building, which is estimated to cost $1,500,000. The several designs will be judged by four architects of national reputation, Supervising Architect Taylor being on the board of judges, ex-officio.

Concordia Club to Build

The Concordia Club of San Francisco recently held a competition for a new club building to be erected at the corner of Van Ness avenue and Post street. The following architects were invited to submit sketches: Landsburgh and Joseph, Alfred H. Jacobs, Julius Krafft, Salsfield and Kohlberg, and M. J. Lyon. The building will cost about $75,000.

Form Partnership

Architect William A. Newman has formed a partnership with Architect Creighton Withers, with offices in the Russ building, San Francisco. Mr. Newman is well known as assistant to Superintendent of Construction of Government Buildings Roberts, whose office is in the Postoffice building, San Francisco.

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THE PORTLAND EXHIBIT AND THE PACIFIC COAST LEAGUE

It was, after all, a modest gathering, or rather a gathering of weighty men conspicuous by their avoidance of ostentation. Had it been a convention of politicians or lawyers there would have been throngs of silk-hatted men posing in dignified attitudes around the hotel lobbies — men with flowing coattails, fervent hand shakers; or a convention of merchants or real estate men. What bustle, what activity, what mixing of good mixers! What a public event would it have been. How the daily press would have boasted of the importance of this meeting, and how the functionaries would have hustled and elbowed to get to be seen in the front rank.

The press behaved very properly; but, as it invariably reflects the state of comprehension of the multitude, the press gave no indication of seeing anything more important in this convention than a meeting of architects whose conduct seemed quite proper, and was useful in furnishing a suitable amount of copy.

Papers sometimes get things wrong, reporting that there was a banquet in the Portland hotel rathskeller, for instance. Participants at that function assert with much earnestness that it was merely a cold lunch, and those who did not take ginger ale had to munch their sandwiches with ice water.

The architects came together in Portland, and for the first time in the history of the Pacific States met each other, and formed themselves into an organization. It has been these men who have given shape, grace, utility to the great cities of the Coast in one generation, who have changed in one half century San Francisco from a camp of tents and shacks to a metropolis rivaling Paris, lost it and built it up again; Portland from a village to a second Hamburg—and better looking; and Seattle from a cannery to a storage battery of aggressiveness and advertising. Some of these men—intellectual authors of these miracles—came to Portland, just to get together, map out a few things which are suitable and for the common good.

Hereafter there will be more conventions, closer relations among the members, co-operation in matters concerning the standards of professional ethics, annual exhibitions, legislation, education of the aspiring students and draftsmen, and many other things. It is expected that all the other Coast cities will be represented in the next annual convention, which according to present indications will be held in San Francisco.

The exhibition in Portland contained an admirable collection of work. No description, of course, could do this justice, and none is appropriate, because everybody would be entitled to mention. The beginning has now been made in what no doubt will be an important and influential factor in the progress of the Coast and Mountain States—the Pacific Coast Architectural League.

I have purposely avoided mentioning the proceedings of the convention in detail, as they have been reported by the papers; and the list of the officers, likewise. There will be, I understand, a vice-president added to the executive committee from every city which has one or more clubs, members of the League.

ERNST KRINER, Architect.

San Francisco Chapter, A. I. A.

By SYLVAIN SCHNAITTACHER, Secretary.

At a meeting of the San Francisco Chapter, American Institute of Architects, held in the Hotel St. Francis on the evening of March 18th, the Chapter formally adopted and indorsed the new schedule of charges of the American Institute of Architects.

The adoption of a new schedule is due to the fact that while the remuneration of the architect has not been advanced during the past forty years, the cost of production, office expenses and draughtsmen's salaries has nearly doubled and the responsibilities of the architect have been enormously increased by the requirements of the modern structure, with its engineering, mechanical and electrical equipments.

The profession for many years has known that it was not adequately remunerated for its services, and for a number of years the conventions of the American Institute of Architects have considered the advisability and necessity of increasing the architects' fees. At the convention in Washington in December, 1908, a new schedule was unanimously adopted, changing the minimum rate from 5 per cent to 6 per cent and making a number of minor modifications.

Other business transacted at the meeting was the indorsement of the project for holding the next annual convention of the American Institute of Architects at Los Angeles; the consideration of the programme for the competition of the new City Hall as prepared by Mr. Newton J. Tharp, the City Architect. An interesting paper on "Lime Mortar," prepared by Mr. W. S. McLean, was presented to the Chapter, and at the request of the Building Committee of the Board of Supervisors a committee from the Chapter was appointed to discuss the site and plans for the new City Hall.

The Peer of Hardwoods

FOR refined expression in the manufacture of all forms of interior decoration, mahogany is undoubtedly the peer of the hardwoods. No wood is so universally used today for this purpose in every city and country of the world; no wood is so freely and successfully imitated.

America's architects and men of the furniture and cabinet making industries draw heavily upon the markets of the world in the struggle to supply an ever-increasing demand for genuine mahogany. Hundreds of tons of logs annually are imported into this country and worked into beautiful forms to grace fine homes or dignify the interior of public buildings, large hotels or railway cars.

A few years ago mahogany was regarded as a very precious wood and was employed only in the interior of the finest houses and in the manufacture of the most expensive furniture. During the past few years, however, there has been a wonderful development in mahogany importation and use.

The total quantity of mahogany imported last year was nearly 42,000,000 board feet. Of this large amount North America supplied 65.6 per cent and Europe 18 per cent. Though Europe supplied only a little more than one-fourth as much mahogany as there was imported from North America, its average value per 1,000 feet was more than twice as much, due to finer quality. The remainder of the imports came from Africa, South America, and Asia.

Pacific Union Club's New Home

The Pacific Union Club is going to rush work on its new club house on Nob Hill, San Francisco, and Architects D. H. Burnham & Company are completing the drawings with all possible speed. The club has secured a satisfactory loan of sufficient size to insure the erection of one of the handsomest club homes on the coast.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

The Relation of Efficiency to Art in House Lighting

In no case of artificial lighting is the artistic side of more importance than in domestic illumination. With the exception of the few rooms devoted exclusively to the practical and mechanical departments of housekeeping, artistic effects are second only to hygienic quality, and both have or ought to have precedence over mere dollars-and-cents economy.

It is universally admitted that the most serious defect of modern high-power light-sources is their glare, or in the technology of illuminating engineering, intrinsic brilliancy. This applies alike to mantle gas burners and of all forms of electric light. In order to overcome this defect diffusing globes, or reflector shades which completely screen the sources, are an absolute necessity. The use of such accessories, however, always means a certain amount of loss of light, and a consequent reduction in the efficiency; or to put it more intelligently to the layman, a soft, diffused light can be had only at a greater cost of illuminant, whether it be gas or electricity.

The relatively higher efficiency of the mantle gas burner has given it a decided advantage in this respect. The cost of producing light being so low, a considerable portion can be sacrificed for the sake of diffusion, and still leave a satisfactory efficiency. This practice has come to be very general. Bare mantle burners are now comparatively rare, especially in house lighting, either fairly dense opal shades, or reflectors which hide the mantle, being generally used.

Not the least of the advantages of the new high efficiency electric lamps is the opportunity which they offer for the use of better globes and shades for the purpose of securing the proper diffusion, as well as the production of artistic effects. With the consumption of electric current cut to a third, the sacrifice of a part of this economy for the sake of better illuminating results will be cheerfully made. Thus far the tungsten lamp has largely been used for commercial or semi-commercial purposes. Its use for domestic lighting has been given comparatively little attention, and, in fact, its use for this purpose is generally frowned upon by fixture manufacturers on the plea that "it gives too much light, and cannot be adapted to artistic treatment." They do not seem to realize that their statement in itself is a straight contradiction of terms. The higher the efficiency of a lamp, other things being approximately equal, the greater the opportunities for artistic results. While an art glass or decorative globe absorbing half of the light would be out of the question in a great number of cases with the old style carbon filament lamp, it is quite possible with a lamp giving three times as much light for the same quantity of current. The tungsten lamp can now be had in the familiar sixteen candle-power bulb, and will operate equally well in the vertical or pendant position.

The use of illuminating glassware, which has more than doubled the opportunities for artistic effects in artificial lighting, is a result of the improved methods of producing light, all of which, without exception, take the form of light-sources of greater brilliancy. When the candle was the best form of light available, decorative effects were confined to the ornamentation of the supporting mechanism. The higher efficiency which has resulted from the higher intrinsic brilliancy of modern light-sources has opened up the entire field of art glass, with its limitless possibilities, to the use of artificial light. Even the deluge of light from the flaming arc lamp is being turned to artstic account in connection with the use of art glass.

Speaking of candles brings up the question, which has elicited very widely diverging opinions, as to the artistic merit of imitation candles.

On this point a critic discussing church illumination, in a recent issue of the Illuminating Engineer (London), says:

"The illuminating engineer must consider whether the old arrangement, satisfactory as it may have been from the point of view of the illuminants available, and the prevalent feeling when the original fixtures were put up, is equally so in the case of modern light sources. At present there seems to be a need for authoritative expression of the views of the architectural profession on these points: there is a tendency, for instance, to attempt to secure the improved conditions of illumination obtainable from modern sources, and yet to imitate the relatively feeble ancient devices."

The writer then cites the use of a bank of imitation candles in which metallic filament lamps are used.

The Builder, commenting upon the matter, says:

"As far as this journal represents architects, we can assure the writer that the imitation of candles in electric lighting is a silly and absurd sham, with no artistic principle of any kind to recommend it."

This is certainly an unequivocal expression of opinion, and it would be interesting to know to what extent it actually represents the ideas of the English architects.—The Illuminating Engineer.

Quality in Plumbing

Economy, as applied to the work of the plumber, cannot be regarded as synonymous with cheapness of cost. Cheap plumbing is always expensive in the end, making necessary continual and expensive repairs, which would have been avoided had the work been done properly and with proper materials at first. Practical, go-ahead plumbers, who are holding their own in the business, are not liable to adopt new systems unless their merits have been established by actual tests. The same articles that have been used for years are still being employed, in many cases, although they are looked upon as "old-fashioned," because they are designed in proper proportions in every respect, and not only operate in a satisfactory manner, but have their parts so arranged that they are capable of giving first-class service, even after they have been used, and "abused," for several years. Some of these old supplies really cost more money than newer ones which have been invented to supplant them but, in the end, they are the more economical of the two.

One of the methods employed by manufacturers of the new designs of plumbing supplies, to cheapen their products, has been to make brass goods of excellent design, but which are so scant in real brass that they cannot be regarded as constructions of real merit. The saving of the brass cheapens the product, and makes it attractive to the owner or builder who rates economy only by dollars and cents; but the use of such makeshift supplies always results in eventual loss in dollars and cents. The designs are not strong enough to sustain the strain to which they are subjected, and the result is that they are constantly getting out of order and necessitating a call on the plumber for repairs, which involves the payment of more money.

Heavier brass goods than some which are used efficiently are often properly rejected by the conscientious plumber because they are faulty in design and proportion. There are water-closet combinations on the market which are so faulty in their action that the poor plumber, who is so unfortunate as to be attracted by their cheap price, will have lots of trouble before he can induce his customers to cease their complaints, if he does not have to substitute some really fine goods when he has a customer who understands how a water closet should operate. Owners who have not learned the difference between good enamel ware and seconds and thirds, are very much at a disadvantage when they have to figure against a plumber who intends using one of the competition tubs, especially when the competition tub does not bear the stamp of its quality upon it.

Owners and builders should always choose the very best in their purchases of plumbers' supplies. The plumbing is in reality the most important part in the construction of a home. If this is faulty, it makes no difference how elegant the design of the building, or how elaborately it is decorated to attract the eye, the structure is a failure, and constant worry and annoyance is waiting for the occupant.—Ex.

A Plea for Hot Air Heating.

THERE is no denying the fact that in many parts of the country a strong prejudice exists against warm air heating, said Mr. E. H. Roberts, of Minneapolis, in a recent paper before the Midland Club: It is claimed by many that furnaces are dusty and dirty; that they will not heat the sides of buildings most exposed to the winds; that they are extravagant in fuel, short-lived, and at best a temporary expedient, excusable only on the ground of the owner's inability to afford anything better.

This attitude of the public mind toward warm air heating might in a measure be explained as a result of clever advertising on the part of the boiler manufacturers, but the fundamental trouble is that a great many furnaces do smoke and gas and throw dust into the rooms and burn double the fuel they should; in fact, they act precisely as the enemies of warm air heating claim all furnaces do; and how is it possible to convince a community that furnace heat is superior to all other kinds when nearly every furnace in the neighborhood is a striking example of how successful a warm air furnace may be for cold storage purposes?



Now I need not waste time in trying to convince you that the failures of most warm air furnaces are not due to defects in construction or to any inherent weak-

ness in the system of warm air heating. Every man here has probably known instance after instance where his furnaces have been condemned, and possibly thrown out, simply as a result of ignorance or carelessness on the part of the workmen who installed them.

Manufacturers Must Do Educational Work.

You as manufacturers may disclaim any responsibility for the blunders of the men who place your apparatus, but you cannot escape the consequences, and, in my opinion, if warm air heating is to be restored to its rightful position as the most economical, satisfactory and sanitary system of heating for residences of average size and for many kinds of public buildings, something must be done to enlighten the furnace dealers of the country regarding the essential requirements for successful installation.

I do not mean by this that absolute rules can be laid down that will enable any man of average intelligence to install any kind of a warm air plant in any sort of building. The fact is that, in order to determine the most economical and feasible method of installing a warm air plant, it is necessary to first make a careful study of the building to be heated, taking all the conditions into consideration.

There are, of course, certain rules which may help, in a general way, to prevent the most disastrous mistakes, and yet nowhere is the old saying—that a little knowledge is a dangerous thing—more apparent than in the realm of warm air heating. Even the proper size of the furnace depends so much upon the character of the building, the air supply, the arrangement of the warm air connections, the climate, winds, etc., as well as on the construction of the furnace itself, that it would be exceedingly difficult, if not impossible, to devise any general rule along this line that would not be more likely to make trouble than to prevent it.

Source and Amount of Air Supply.

Again, there is the question of the air supply, on which it would be hard for furnace men to agree. In the South, East and extreme West outside air seems to be quite satisfactory, while in the North and Middle West practical experience has shown that it is impossible to secure satisfactory results or a reasonable economy of fuel without using inside air circulation, and is it not ridiculous to expect a warm air furnace to continuously raise the temperature of the air from 30 to 40 degrees below zero to 70 degrees above with no more fuel than would be required for a hot water plant in the same building that simply maintains a 70-degree temperature without any change of air?

And yet there is perhaps no one thing that has led to more furnace failures than the use of inside air for cold air supply. In the first place, the amount of inside air supplied to the furnace is almost always inadequate. Oftentimes I have seen furnaces with warm air outlets aggregating 500 to 600 square inches supplied with only 100 or 200 inches of cold air, and even this miserable allowance so retarded by circuitous windings that it had apparently become discouraged and had given up as futile the attempt to reach its destination.

If my time and your patience were inexhaustible I would be glad of this opportunity to mention more of the causes for failures in warm air heating that have come to my notice; and I would also like to outline some of the points which I have found essential to success; for instance, an arrangement of the cold air returns for residence work that will satisfy the owners, and at the same time secure the best results; likewise, the advantage of using a single basement pipe to heat two or more rooms, and the best method of using outside air in conjunction with the inside cold air supply, etc.

I would like to divide the subject of warm air heating and discuss separately the best methods for heating the various

kinds of buildings. And right here it might not be out of place to say that in my opinion there is no class of buildings where superiority of warm air heat can be more clearly demonstrated than in school houses of from six to ten rooms; nevertheless, school heating with warm air furnaces has even a less enviable record than furnace heating in residences. But for the school house failures the architects are more often at fault than the dealers, for frequently with no practical knowledge of warm air heating or ventilation they insist upon embodying the heating and ventilating systems in their plans, and some of their layouts, as you know, are so impracticable as to be positively ridiculous.

Support Advertising by Scientific Installation.

Now, I am a believer in advertising and realize that "the man who whispers down a well about the goods he has to sell won't reap the shining silver dollars like he who climbs a tree and hollers." But to be permanently successful, advertising must have back of it something more than plausible ideas, and if this campaign of advertising, which, I understand, has been proposed, is to bring returns which are commensurate with the cost, furnace manufacturers must see to it that their apparatus is so installed that it will give complete satisfaction. It is all very well to dwell on the fresh air features of furnace heating and to call attention to the fact that in the State of New York alone fifty regiments of men, women and children go down to death every year as the direct result of lack of ventilation in homes and public buildings; you may prove beyond the shadow of a doubt that fresh air will do more to aid digestion than all the remedies in the materia medica, and that it is a greater tonic than all the millions of bottles of patent nostrums that are consumed each year by a credulous and ailing public at $1 a bottle. But the warm air furnaces which you advertise must do satisfactorily and economically the work for which they were primarily intended, or an unappreciative public will surely insist upon having something else that does, and no amount of advertising on your part will avert this inevitable consequence.

Architects and Furnace Men Ignorant of Furnace Heating Details.

Someone—I believe it was Socrates—once made the remark that against ignorance and prejudice even the gods are powerless. Undeniably, furnace manufacturers are up against both these conditions, for dealers and architects generally are ignorant of the most essential features of warm air heating, and the public in many localities are prejudiced against warm air furnaces; but where the gods of the ancients are reported to have failed I believe we may reasonably hope for eventual success if we persistently and consistently pursue a campaign of education for dealers and architects alike, and by actual demonstration, as well as argument, convince the public that warm air is the most logical, practical and satisfactory system for heating homes and many kinds of public buildings.

Senator Copper's House

By Wallace Irwin.

Senator Copper of Tonopah Ditch
Made a clean billion in minin' and sich,
Hiked for New York where his money he blew
Buildin' a palace on Fift' Avenoo.
"How," sez the Senator, "can I look proudest?
Build me a house that will holler the loudest—
None o' yer slab-sided, plain mausoleums,
Give me the treasures of art and museums;
Build it new fangled,
Scalloped and angled,
Fine, like a weddin' cake garnished with pills;
Gents, do your dooty—
Trot out your beauty,
Give me my money's worth—I'll pay the bills."

Forty-eight architects came to consult,
Drawin' up plans for a splendid result;
If the old Senator wanted to pay
They'd give 'im Art with a capital A;
Every style from the Greeks to the Hindoos,
Dago front porches and Siamese windows,
Japanese cupolas fightin' with Russian,
Walls Senegambian, Turkish and Prussian;
Pillars Ionic,
Eaves Babylonic,
Doors cut in scallops, resemblin' a shell;
Roof was Egyptian,
Gables caniptian,
Whole grand effect when completed, wuz—hell.

When them there architects finished in style,
Forty-nine sculptors waltzed into the pile,
Swinging their chisels in circles and lines,
Carvin' the stone work in fancy designs.
Some favored animals—tigers and snakes;
Some favored cookery—doughnuts and cakes,
Till the whole mansion was crusted with ornaments,
Cellar to garret with garden adornments.
Lettuce and onions,
Cupids and bunions,
Fowls o' the air and fish o' the deep,
Mermaids and dragons,
Horses and wagons—
Isn't no wonder the neighbors can't sleep.

Senator Copper, with pard'nable pride,
Showed the grand house where he planned to abide;
Full of emotion, he scarcely could speak:
"Can't find its like in New York—it's uneek.
See the variety, size and alignment,
Showin' the owner has wealth and refinement,
Showin' he's one o' the tonier classes—
Who can't help seein' my house when he passes?
Windows that stare at you,
Statoos that swear at you,
Steeples and weather vanes pointin' aloof;
Nothin' can beat it—
Just to complete it,
Guess I'll stick gold leaf all over the roof."

New Public Buildings

The following appropriations for work on various public buildings to be erected and also now under construction in the following cities have been signed by the President: Albuquerque, N. M., $30,000; Bellingham, Wash., $30,000; Honolulu, H. T., $150,000; Los Angeles, $137,500; Sacramento, $45,000; San Francisco, mint, $15,000; Santa Barbara, $50,000; Salisbury, Cal., $20,000; Santa Cruz, $40,000; Santa Rosa, $20,000; Spokane, $75,000.

By the Way

Some Industrial Information Worth the While

"Anchor Brand" Laundry Trays

"Anchor Brand" laundry trays possess so many points of superiority over other makes of cement trays that any one who purchases a tray without investigating "Anchor Brand" is acting with only a partial understanding of the possibilities of cement tray construction.

M. L. Kline, who handles the "Anchor Brand" cement tray in Portland, Ore., speaks in the highest terms of Mr. Dondero and the quality of trays that he supplies to the trade. His dealings, he says, are honorable and he carries out his guarantee to the letter. Mr Kline says further:

"There are so many inferior and cheaply constructed articles made in the plumbing line that it is a pleasure to do business with a man like Mr. Dondero and to sell his goods, even if we do not make any large profit.

"The Anchor Brand" cement laundry tray is one of the best known makes of laundry trays on the market at the present time. Its use by the best business houses in the Pacific Northwest indicates that its value is appreciated."



New Southern Pacific R. R. Co.'s Hospital—D. J. Patterson, Architect

An advertisement in this issue of The Architect and Engineer will give some idea of the tray and its merits. Architects are advised to look into this brand of cement trays and by insisting upon their installation through their specifications they will save themselves and clients expense and trouble that are sure to follow the use of cheaper and inferior trays.

Do You Want a Good Draughtsman or Engineer?

Attention is called to the advertisement of the San Francisco Engineering Agency in this number of "The Architect and Engineer."

This agency has been established since the first of the year at 328 Monadnock building, San Francisco, and has proved to be of considerable assistance to those desiring technical help at short notice. Employers who do not wish to be inconvenienced by personal calls of applicants can telephone to Mr. W. J. Keays, himself a well known civil engineer, and be assured that any man he sends them will be competent or performing the duties for which he is recommended.

The references of all applicants for positions are carefully investigated and if not found satisfactory they are not listed, as Mr. Keays believes that the future success of his enterprise depends entirely upon his ability to put the right man in the right place.

For Mailing Blue Prints

Architects and engineers will find in the Telescope mailing case manufactured by the Mailing Case Company, of 264 Natoma street, San Francisco, an article that is calculated to fill a long felt want. To mail drawings and blue prints so they will reach the owner in good condition has heretofore been more or less of a problem to the members of the profession. Not so any more. The Telescope mailing case answers all requirements for mailing, and is also invaluable as a filing device.

It is made of heavy cardboard, having both ends reinforced with either paper or tin, and is so constructed that the article to be mailed or filed can be easily inserted and is completely protected. It is a great saver of time and does away with all wrapping and tying.

The cases are being manufactured by the Mailing Case Manufacturing Company, which has recently purchased the factory of the World Mailing Case Company and the right to manufacture these cases on the Pacific Coast.

An Improved Coupling

The Felton improved couplings for conduit and sewer rods are recommended by practically all the municipalities and leading contractors and electric light plants throughout the United States. The L. E. Boyle Company, Inc., of San Francisco, has the agency on the Pacific Coast for the Harold L. Bond Company's goods, including the Felton couplings. Here are a few "strong points" which users of couplings should keep in mind:

Cannot by any possibility separate in the pipe or conduit.

Can be coupled and uncoupled in a twinkling.

Can be turned in either direction without unlocking.

Easiest and quickest to adjust.

Seldom get out of order—it isn't very often you have to repair them.

Attached to rods in three-foot or four-foot lengths, all ready for use; also made to order in special lengths. If you want the couplings only, the dealers will furnish them in that way, too.

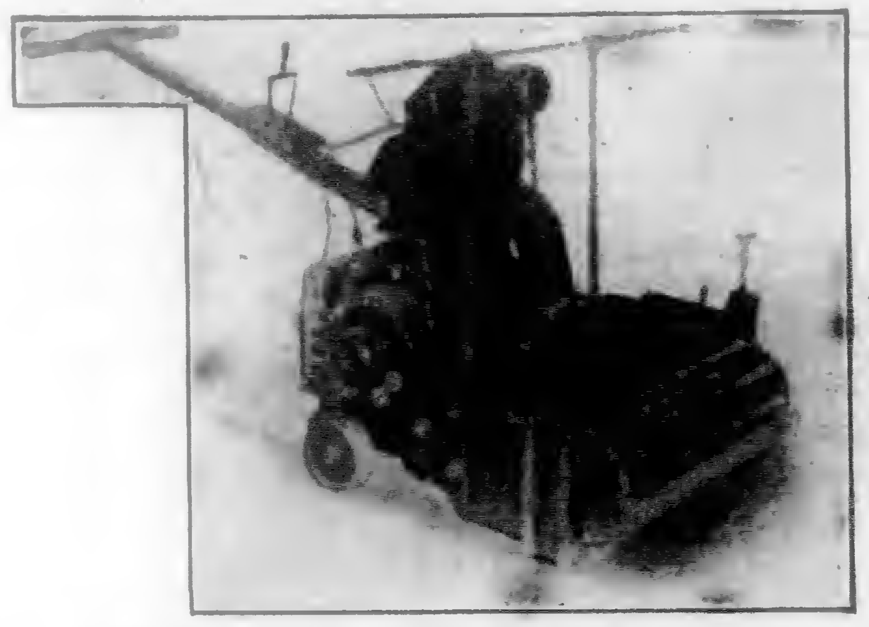
The Brick Combine

The brick combine in which Gray Bros. have interested themselves does not include the pressed brick manufacturers. It takes in only the common brick makers such as the Remillard, Carquinez and others.

A Perfect Rapid Floor Surfacer

The Inlaid Floor Company of San Francisco, appreciating the general movement down town, has located at 398 Eddy street, corner of Leavenworth, where a handsome show room and offices have been fitted up. This company is a splendid example of the co-operative idea, each and every employe having a dividend earning interest in the concern which deals exclusively in home products and handles only home made goods. Its hard wood floors are to be found in many of the finest business buildings, apartment houses and residences in San Francisco.

Recently the company has taken the exclusive agency for the Schlueter Rapid Floor Surfacer, and so confident is Manager Reynolds that the machine will give entire satisfaction that he offers to fill your order for a machine on two days' examination and thorough trial. If you then do not wish to keep the machine, you are to return it at once to your local freight or express agent. In express shipments invoice and lease is forwarded through your express agent. The express agent will refund the amount of your invoice if you do not keep the machine. In freight shipments bill of lading with draft, invoice and lease will be sent to any bank you select.



If you do not wish to retain the machine, return bill of lading to the bank and receive refund of invoice. This plan shows confidence and fairness. Ample time is allowed for a thorough test and return freight or express charges are paid if you are not entirely satisfied.

The lease above mentioned is furnished merely to afford continued protection during the life of the patent to parties who have been allowed exclusive territory.

The machine is built on the only correct principle. It is guaranteed to be the best machine with which to produce an even, smooth surface on any kind of wood floor, old or new, hard or soft, and in all buildings, residences, stores, factories bowling alleys, roller skating rinks, reception and dance halls, etc. The Schlueter will remove all joints or warped edges, and leave the floor perfectly smooth. It will remove shellac, varnish, oil, wax, lime stains, or the "muck" from skate wheels in a most satisfactory manner.

The contractor leasing a Schlueter Rapid Floor Surfacer and advertising the fact that he is ready to do perfect work will soon have all the work he can do. The Schlueter machine will easily earn a net profit of not less than from $10 to $25 a day when in operation.

The Schlueter Rapid Floor Surfacer is so constructed that a roller, to which a sheet of sandpaper is quickly adjusted, is brought in contact with the floor surface while revolving at a speed of 600 revolutions a minute. It is guaranteed to do the work cheaper and smoother than any other machine or method.

There is a very large demand among contractors, builders, rink and amusement park owners for a surfacing machine at a low price and the Schlueter machine seems to fill the requirements. The Inlaid Floor Company will ship these machines to any point on the coast and will be glad to arrange for its sale through out of town agents at liberal commissions.



Stone Apartments, Oakland
Louis S. Stone and Henry C. Smith, Architects

About Fuel Oil Plants and Burners

The use of oil as a fuel began in California some years ago when apparatus for burning crude petroleum in large boilers was installed and high pressure steam used as the atomizing agent. For a number of years this was the only use made of oil for fuel purposes, but the great advantages in cleanliness together with economy, both in fuel and labor, have caused a demand for it as the general fuel in this section for all purposes—until now—no modern office building, hotel, restaurant, laundry, bake oven, apartment house, or private residence (where a heater of any kind is used) is considered complete or up to date unless an oil burning outfit is installed.

For smaller office buildings, apartment houses, and residences where steam, hot water, or hot air is used for heating, and also in bake ovens, it has been found that the distillate oil (an oil of light specific gravity) is preferable to the crude for the reason that on account of its lightness it can be atomized and perfect combustion formed without the use of high pressure steam or air as atomizing agents, and is therefore much simpler in operation and easier kept clean than a crude oil burning system would be, and is more economical, both in first cost and operation for this class of work. Power plants, steam boats, locomotives, and heating plants for large buildings where the oil consumption is very large, find it advantageous to install a system for burning crude oil.

The California Oil and Burner Company make a specialty of installing oil burning systems for heating and cooking, and plants installed by them are found in many of San Francisco's high class buildings, a few of which we name:

Bank of California, Bank of Italy, Metropolis Bank Building, Clunie Building, Jewelers' Building, Oscar Luning Building and the Fairmont Hotel.

In Oakland, Alameda and Berkeley they have installed over 1500 oil-burning systems, among the better known are:

First National Bank, Hotel Metropole, Hotel Crellin, Hotel Avalon, Oakland Public Library, Oakland Postoffice, The Forum Cafe, Stone Apartments, Lake Shore Apartments, the new Scottish Rite Cathedral and Newman College Inn.

This company not only installs plants, but delivers the oil in Oakland in its own tank wagons, which is found a great convenience by its many patrons.

Mr. Geo. C. Morgan, the president of the California Oil and Burner Company, and the inventor of much of the apparatus used by the company in its different systems, is recognized as an authority in the business, and to him much of the credit must be given for the advanced stage of the oil burning industry.

We are illustrating in this issue the handsome Stone Apartments in which the company installed one of its Pneumatic Distillate Oil Systems some two years ago, which ever since has been run by a Japanese attendant, giving perfect satisfaction.

POSITION WANTED—Building superintendent open for position; 20 years' experience; ample references. Box 77, Dewey House, Fourth and Howard streets, city.

A Reliable Concrete Mixer

The L. E. Boyle Company of San Francisco are the exclusive agents in Northern California for the Wallace hoist and concrete mixer which are, without doubt, two of the best machines for this class of work on the market today. Mr. Boyle reports several sales of mixers to San Francisco contractors the past month, while the hoist is in use on nearly every building job of consequence in the Bay City. F. T. Crowe & Company of Portland, Seattle and Tacoma represent the Wallace-Lindsmith Company in the Northwest territory, and they also report a good demand for the company's machines.

Carnegie Brick in Demand

The Carnegie Brick Company has had no cause to complain since the beginning of the new year for business has been good with them. The company owns one of the best plants on the coast and its shipping facilities permit of prompt deliveries which is an important factor in the brick business today. The handsome pressed brick front of the Methodist Book Concern's new building on McAllister street, San Francisco, was turned out by the Carnegie Company. This building was designed by Architects Meyers and Ward. The Hotel Cadillac at the corner of Eddy and Levenworth streets is also built of Carnegie brick and terra cotta.

In Electricity There Is Life

Never was there a more true saying, and possibly never was there a sentence so commonly used which meant so much in so few words; and, if facts count for anything, we must admit that those who deal in electricity must be inspired with the same life—at any rate, there is one concern which we are about to mention that has proven itself full of it.

Right in the center of Portland's business district are the pretty and well arranged store and offices of the Comet Electric Company, famous for its rapid growth, the direct result of its reliability and fair treatment to all, which has won for the company a desirable place in the business community.

The Comet Electric Company has a long list of buildings, both large and small, to which it can look with pride and say, "We wired this building."

Among the more prominent ones are the Board of Trade building, the Rothchild building, the McKay building, the Sherlock building, the new Labbe building the beautiful mansion of Mrs. M. H. Houser on Portland Heights, the Country Club on Portland Heights, the mansion of Mr. L. Olsen on the East Side, and others.

J. G. Braun's New Catalogue

For many years J. G. Braun, the well known manufacturer of plain and ornamental wrought iron, has published one of the most complete catalogues found in an architect's office. This year's book, just at hand, is no exception to the rule—in fact, the 1909 catalogue is larger and more complete than ever. It is an indispensable fixture in every architect's office, and the readers of this magazine who have not already received one are entitled to the book free upon application. There are more than 100 illustrated pages with many valuable suggestions in regard to wrought iron moulding, square tubing for elevator enclosures, shears, punch machines, etc. The Braun company keeps in stock all kinds of hand made and pressed ornaments, rosettes, leaves and wreaths, and drop-forged pickets, rivets, balls and screws. The new catalogue is known as No. 14 and in ordering same the number should be given. Address J. G. Braun, 322 So. Paulina street, Chicago, Ill.

Tilton Brothers of Portland

The firm of Tilton Brothers, sheet metal and furnaces, was established in Portland many years ago, in fact, they are numbered among the pioneer business houses of Oregon, and have always had a steady, reliable business from both architects and the residents of the city.

They do a large business in smoke stacks, metal window frames, cornices, tin-clad doors, and when it is understood that Tilton Brothers are at work on a job, the expression is prompted—"That's all right, you don't need to stay there to watch, for when they leave, it will be done right."

They have controlled the sale of the Royal hot air furnaces for years, have a number of patterns, from those designed for small residences to those suitable for large business buildings, and can provide furnaces that burn hard or soft coal, wood, etc.

Cox & Vengelen of Portland

This house is generally acknowledged as experts in steam and hot water heating engineering.

Establishing a business in Portland in the face of keen competition called for technical skill, money, and a determination to get there.

They have advantages in a system, devised and inaugurated by themselves, which is appreciated by their customers, and many of the largest and handsomest Portland buildings are equipped with the Cox & Vengelen system although other plans were offered at lower prices.

They have lately equipped the following: Four buildings for W. J. Morgan, the Odd Fellows Temple, the Hawkins buildings, and the Y. M. C. A. building, and they also installed both the heating and power plant at St. Mary's Home, Oswego, and the heating plant at McMinville college, the latter being a large and important contract.

The W. G. McPherson Company

That the residents of Portland and vicinity have had during the past winter an object lesson regarding the needs of a properly installed heating plant goes without saying, and from the volume of business the W. G. McPherson Company have at this time under way and booked for future months, together with the grateful letters from scores of their customers for whom they installed heating plants in time past is enough to satisfy the most skeptic.

The installation of fifteen complete heating systems in as many large and important public schools in Oregon, Washington and Idaho, has been accomplished in the past few months.

The McPherson Fan system has many advantages peculiar to this system alone—the maximum of pure fresh air delivered at a minimum of cost—in fact much less than the average cost. They have references by the score that they are anxious to furnish to anyone interested as well as their illustrated catalogue and other literature. Drop them a postal card.

An Index to the Advertisements

[Index continued on Page 103.]

The Morrison Electric Company of Portland

While not occupying the largest building devoted to this line of business in Portland, these men have in two years built up a very important business, and, from their skill and reliability, are recognized by the Portland architects and by the public generally as occupying a very enviable position in the business world.

Portland being so far from the great Eastern manufacturing centers, there are times when the city's business men are called upon to accomplish what ordinarily one would say was practically impossible. Not long ago there came to the Morrison Company an order for one hundred lighting fixtures of a particular design, for a building which was to be dedicated with an evening opening. The fixtures desired were not in stock, and the opinion held that the owner would have to accept others, and possibly several patterns to make up the full number; but the Morrison Electric Company, being appealed to, got busy and the entire lot was made in their shop and installed in the allotted five days.

The making of specially designed fixtures to harmonize with other interior finishings or decorations, according to the particular ideas of the architect, decorator or owner, is given careful attention by this house.

A Fireproof Home—Scientifically Built

What promises to be one of the most modern and scientifically constructed residences in California will be built by C. Bushnell at the northwest corner of Pico street and Westchester place, Los Angeles.

In designing the dwelling it has been the purpose of both the owner and the architect, H. Alban Reeves, to produce a home, and not a palace. A dwelling is sought for year-round residence, embodying some of the simple charm of those delightful villas which have made Italy world famed.

The character of the construction is another feature which is attracting attention. When more homes are built in the same manner there will be fewer fires, and less disease than at present. Hollow tile blocks will be used for walls, floors and partitions. These blocks will be enameled on the exterior, and when once in place the exterior finish will be complete. The enameled surface will present an enduring material, believed to be capable of withstanding for all time the ravages of climate, wear and other agencies so destructive to the ordinary construction. A feature of this material is that it will be "made in Los Angeles" by the Los Angeles Pressed Brick Company.

To make the building fire and earthquake proof the hollow tile will be laid in cement mortar, with metallic fabric between the horizontal joints. This will bind the entire mass, and lend strength and rigidity to the wall. Houses built in a similar manner withstood all the stress and shaking of the earthquake which recently devastated Southern Italv.

The tile blocks will be enameled in a soft bronze green for the body of the structure, with light-colored enamel trimmings. The inner faces of these tiles will be left rough and corrugated, and will present an ideal surface for plastering, thus avoiding the expense of lathing, and also eliminating sources of fire danger, as the materials from the exterior face to the interior trim will thus be

incombustible. The blocks being hollow, and so laid that the hollow interiors are a series of dead-air cells, the class of construction is a long stride toward maintaining an even temperature indoors regardless of the climatic conditions outside.

Another advantage claimed for this class of building is the speed which can be attained in erection. The blocks are lighter than brick, stone, or concrete. Each one takes the place of fully a dozen ordinary building brick, so there is obviously a large saving of time, to say nothing of the mortar required.

The Culebra Cut Bridge

Work has begun on the foundations for the suspension bridge over Culebra cut at Empire, Isthmus of Panama. The bridge will run from Cerro, the labor camp immediately south of the central division offices, directly across the cut. The towers will be built of creosoted timber, and will be 60 feet high. On the west side they will rest on a concrete foundation built on rock, and on the east side on concrete built on piles, which will be driven down to bed rock. The anchorages will be of concrete, reinforced with old French steel. The cables will be of 2¾-inch galvanized steel suspension bridge wire, two on each side, with the cables of each pair only an inch apart. The total length of the four cables will be 3,480 feet; the length of the bridge between towers will be 600 feet, and the width of the roadway seven feet. The total dead load will be 230,000 pounds, the live load capacity, 54,000 pounds, and the breaking strain of the four cables 2,480,000 pounds.



The Hotel Argonaut, San Francisco

SAN FRANCISCO is again coming to the fore as a city of many fine hotels. Among the better class of hostelries recently opened to the public the Hotel Argonaut stands out prominently. It is third in point of size now doing business in San Francisco, having 400 rooms and 200 baths, with every convenience to be found in a first class hotel. The building was erected by the Society of California Pioneers and occupies a central location, within a stone's throw of the corner of Fourth and Market streets. The structure is six stories high, is lighted from three sides, facing eighty feet on Fourth street, one hundred and seventy-five feet on Pioneer Place and one hundred feet on Jesse street.

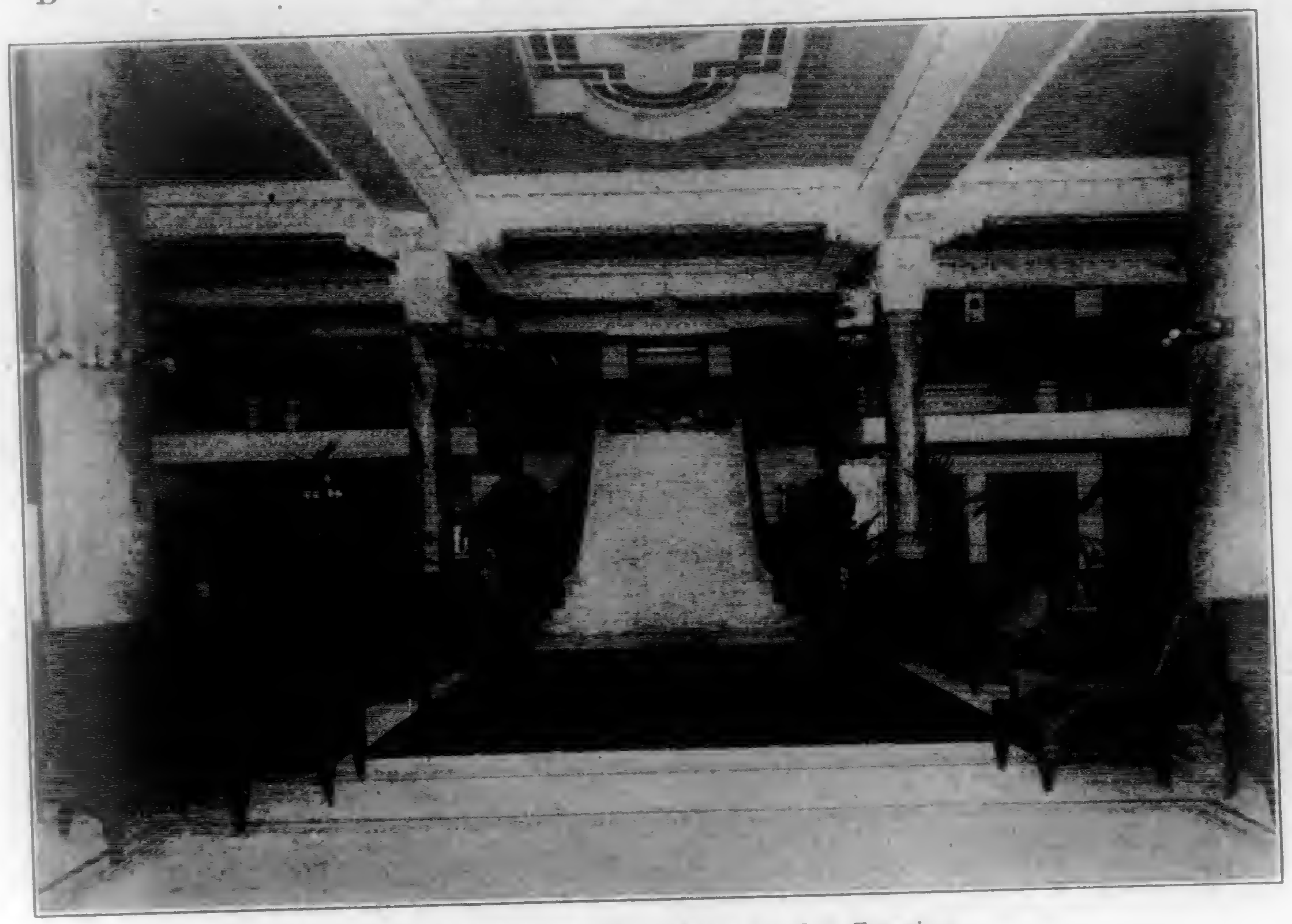
The entire ground floor is given over to the spacious lobby (second largest in the city), private offices for the managers, the dining-room, banquet rooms, buffet, kitchen and service rooms. The main entrance to the hotel is on Pioneer Place, with another entrance direct from Fourth street.

As the visitor stands within the door of the entrance on Pioneer Place, facing the lobby, the grand stairway of Alaska marble is immediately in front across the lobby. To his right is the news stand, entrance to the main dining-room, and the two high-speed electric elevators. To his left is Manager Edward Rolkin's private office, the public stenographer's office, telephone booths, and the clerk's and cashier's desks. The immense pillars in the lobby are of scagliola, of handsome finish, while the lobby is finished in Alaska marble. The great divans and lounging chairs are finished in Spanish leather of brown tone. A feature of the hotel is the ladies' writing room on the mezzanine floor overlooking the lobby.

The kitchen of the Hotel Argonaut is arranged after the plans of Steward W. B. James, and is considered one of the most convenient in the city. It is forty by seventy-five feet and has a twenty-four foot ceiling. The light and ventilation is excellent. It is equipped with a 22-foot oil burning wrought iron range. The coffee urns are of the latest design of Home Comfort make. The cold storage plant was built to order, and embodies all the latest ideas in refrigeration. The capacity of the ice plant is six tons per day.

The California Society of Pioneers, which owns the Hotel Argonaut building has 800 members, consisting of the men who settled in California in 1849 and 1850 and their decendants.

The register of the Argonaut stretches over five pages daily, which helps to attest the favor the new hotel enjoys from the public.



Lobby and Staircase, Hotel Argonaut, San Francisco

In measuring the material success of the Argonaut Hotel, due regard must be made of the things that have contributed to it, and not the least of these are perfect service, rendered possible by the constant attention of the most able and experienced manager.

Edward Rolkin, president and manager of the Hotel Argonaut, went to San Francisco nearly thirty years ago a poor man. By judicious investments in rooming houses and hotels for people of moderate means he amassed a fortune passing into the millions. At the time of the great San Francisco fire Mr. Rolkin owned twenty-six hotels and rooming houses, with a total of over ten thousand rooms, being known as the "Rooming House King." He now controls the following hotels in San Francisco: Argonaut, Winchester, Central, Overland, Denver and Irwin. He is also a large owner of San Francisco real estate.

Teak as a Cabinet Wood.

White Brothers, the pioneer hardwood lumbermen of Spear and Howard streets, San Francisco, are having quite a number of calls for teak for interior finish. Teak is a wood which has been somewhat neglected as a cabinet wood on this coast, and, in fact, in the entire United States. In England it is considered the queen of cabinet woods. It is one of the finest woods for furniture and interior trim, and in Pasadena quite a few wealthy homes are fitted with teak interiors. This lumber needs only to be sanded smooth and then rubbed with oil. This brings out a most exquisite coloring and makes a finish which is unsurpassed. Teak interiors and fixtures and also those made from the Philippine mahogany, which has lately come into the market, will be a pleasant change from the oak and mahogany with which we are so familiar. Among the architects one hears on every side, "Isn't there something new in the way of hardwood for interior fixtures?" Teak seems to be the answer to this question, although its price, $250 per thousand, may deter many from aspiring to an interior made from this, the most expensive of all cabinet woods.

Move Offices to New York City.

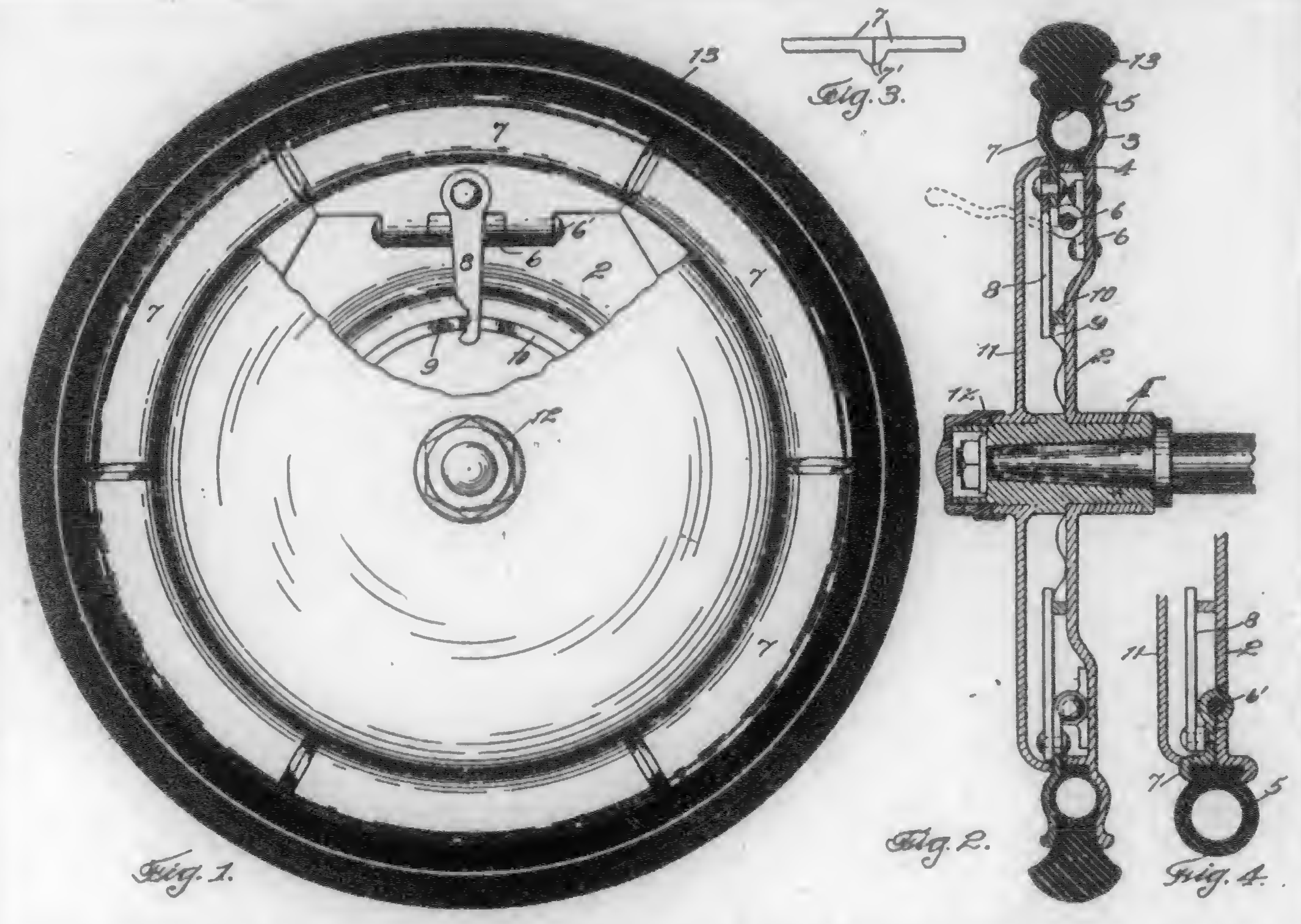
The Star Expansion Bolt Company of Bayonne, N. J., whose standard line of expansion bolts, toggle bolts, cable hangers, drills and drill holders are so well and favorably known to the trade, have removed their general offices from Bayonne to 147 Cedar street, New York city, where a very complete stock will be maintained at all times, and where the company hope to have the pleasure of receiving their friends who may be either located permanently in the city or just there to see the sights.

Completes Fine Building.

W. McKenzie has recently completed the building for the R. R. Thompson Estate, located on Main street, between Mission and Market streets, San Francisco. This is a Class C structure, 184 feet front by 137 feet deep, four stories and basement, and has been pronounced a splendid piece of construction work. Mr. McKenzie has several other contracts on hand, including the Casino Estate building on Grant avenue, near Market street. He looks for a profitable year in the building business.

Mr. Eddy to Handle Hydrex.

Mr. W. H. Eddy, formerly associated with the Southern Pacific company of this city for a number of years, has become affiliated with the L. E. Boyle Company and will manage the "Hydrex" waterproofing and damp-proofing department. Mr. Eddy looks forward to some splendid business, owing to the fact that this well-known waterproofing method has already been used on many large San Francisco buildings with satisfactory results.



Medusa

The Building Material Company, Inc., Monadnock building, local agents of the Sandusky Portland Cement Company, report the following recent constructions for which its Medusa White Portland Cement and Medusa Waterproof Compound has been specified or supplied:

Medusa White Portland Cement: Cailleau building, Grant and Ashburton avenues, San Francisco; Royal Insurance Company building, San Francisco; Metropolitan Life building, San Francisco; Taylor residence, Berkeley, Cal.; Commercial building, San Francisco; Balfour-Guthrie building, San Francisco; High School, Covina, Cal.; Red Bluff Opera House, Red Bluff, Cal.; Pomona college, Claremont, Cal.; Point building, Cleveland, Ohio; Western Newspaper Union building, Chicago, Ill.; Clean Dairy Company building, St. Louis, Mo.; Campbell building, Oklahoma; Battle Creek Sanitarium; Northwestern University building, Evanston, Ill.

Medusa Waterproof Compound: Municipal cisterns, San Francisco; State constructions, Napa and Agnew, Cal.; Babcock building, San Diego, Cal.; Lodi Fruit Produce Company warehouse, Lodi. Cal.; Pacific Fruit Express ice plant, Colton, Cal.; Jackson apartments, Alameda, Cal.; Hollis building, San Francisco; Holbrook, Merrill & Stetson building, San Francisco; Southern Pacific club house, Gilo, Ariz.; New Cliff house, San Francisco; swimming pool, Wilmerding, Pa.; Blackstone hotel, Chicago, Ill.; Municipal hospital, St. Louis, Mo.; St. Anthony hotel, San Antonio, Tex.; D. L. & W. Collieries (concrete dam), Scranton, Pa.; East Jersey Water Company (concrete tank), Summitt, N. J.

Hold Annual Convention.

The Keasbey & Mattison Company of Ambler, Pa., held the usual annual convention of the managers of their various branches throughout the United States the last week in March to plan the future development of the rapidly growing Asbestos "Century" Shingle and the general asbestos business of that concern.

The Keasbey & Mattison Company is one of the "Big Four" companies controlled by Dr. R. V. Mattison, who, in addition to being president of the Bell asbestos mines, Thetford mines, Province of Quebec, Canada, popularly known as "the largest and most productive asbestos mine in the world," which is owned by the Keasbey & Mattison Company, is also president of the Asbestos Shingle, Slate & Sheathing Company and the Asbestos Manufacturing Company, Ltd., of

Lachine, near Montreal, a recent acquisition, which is the first factory in Canada to be equipped for the manufacture of asbestos products upon a large scale.

Dr. R. V. Mattison is also a director in the Amalgamated Asbestos Corporation, Ltd., of Canada, which will control 70 per cent of the world's present supply of asbestos, which is 80 per cent of the supply from the districts of Thetford and Black Lake, Province of Quebec; 90 per cent of the world's present supply coming from that province.

A New Factory for Melrose

The Puncture Proof Auto Wheel Company, with offices at 60-61 Bacon building, Oakland, Cal., has purchased a site and will soon begin the erection of buildings for the manufacture of automobile wheels. The officers and directors of the company are: J. M. Benham, president; B. P. Ober, secretary and treasurer; E. G. Ryker, counsel; G. W. Slater, director and fiscal agent. Mr. Slater is an expert mechanical engineer who has constructed some of the largest zinc plants in the United States, and in whose hands this new venture seems assured of success. Geo. A. Budge is the inventor of this wheel and the Bank of Germany is their depository.

A Fireproof Partition Block

Dodds's Interlocking Block Company, 24 California street, San Francisco, call attention to their Interlocking Partition Block, and claim it to be the best and only interlocking form of partition on the market today. It dispenses with reinforcing rods and forms a strong and perfectly straight, sanitary and soundproof partition. It does not crack, stands hard usage and requires no wood grounds or blocks for fixing trim.

The partition is especially suitable for subdivision of offices, stores and lofts.

The company carries a large stock of 2½ and 4-inch blocks, and will compete with wood stud and metal lath partitions.

Dodds's partitions have been installed in the Emporium, Dr. Merritt building, White garage, Drexler building, Hewes building, and one 20-foot high partition of 4-inch blocks has been installed in the Schroth building, Union square. A sample block will be furnished on request.

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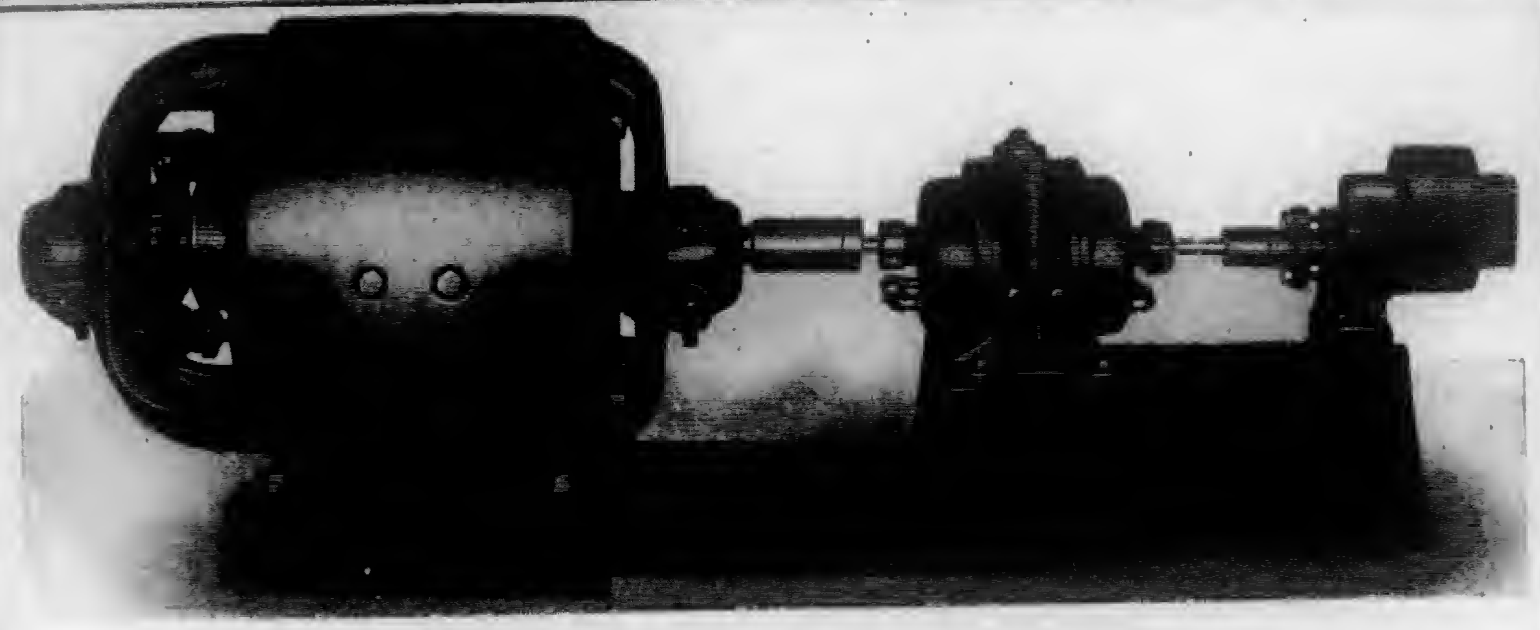
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Continental Fireproofing Company

The Continental Fireproofing Company, with offices in the Mutual Savings Bank building, San Francisco, is a general contracting concern notwithstanding a prevailing impression that the company specializes in fireproofing. As a matter of fact nearly all its work has been done as general contractors. Manager Shiels says they are rushing work on the new fire engine house in Oakland, and excellent progress is being made on a reinforced concrete apartment house for Dr. F. K. Musser in Oakland from plans by Architect Fred Soderberg. The Continental makes a specialty of reinforced concrete work and it is doing all the concrete on the handsome Pillsbury building at Geary and Powell streets, San Francisco.

Private Telephones

Private telephones are not necessarily a luxury. On the contrary they are almost indispensable for certain kinds of business. They make a hotel or apartment house more popular and consequently a better investment for the owner, while for the home—well, no modern home with many rooms is complete without a private phone service. The Electric Railway and Manufacturers' Supply Company of 84 Second street, San Francisco, are agents for the De Veau, Ericsson, and Holtzer Cabot telephones, and detailed information about these several systems will be furnished gladly upon application.

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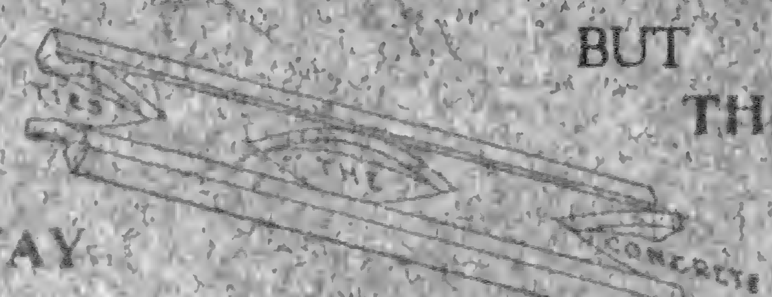
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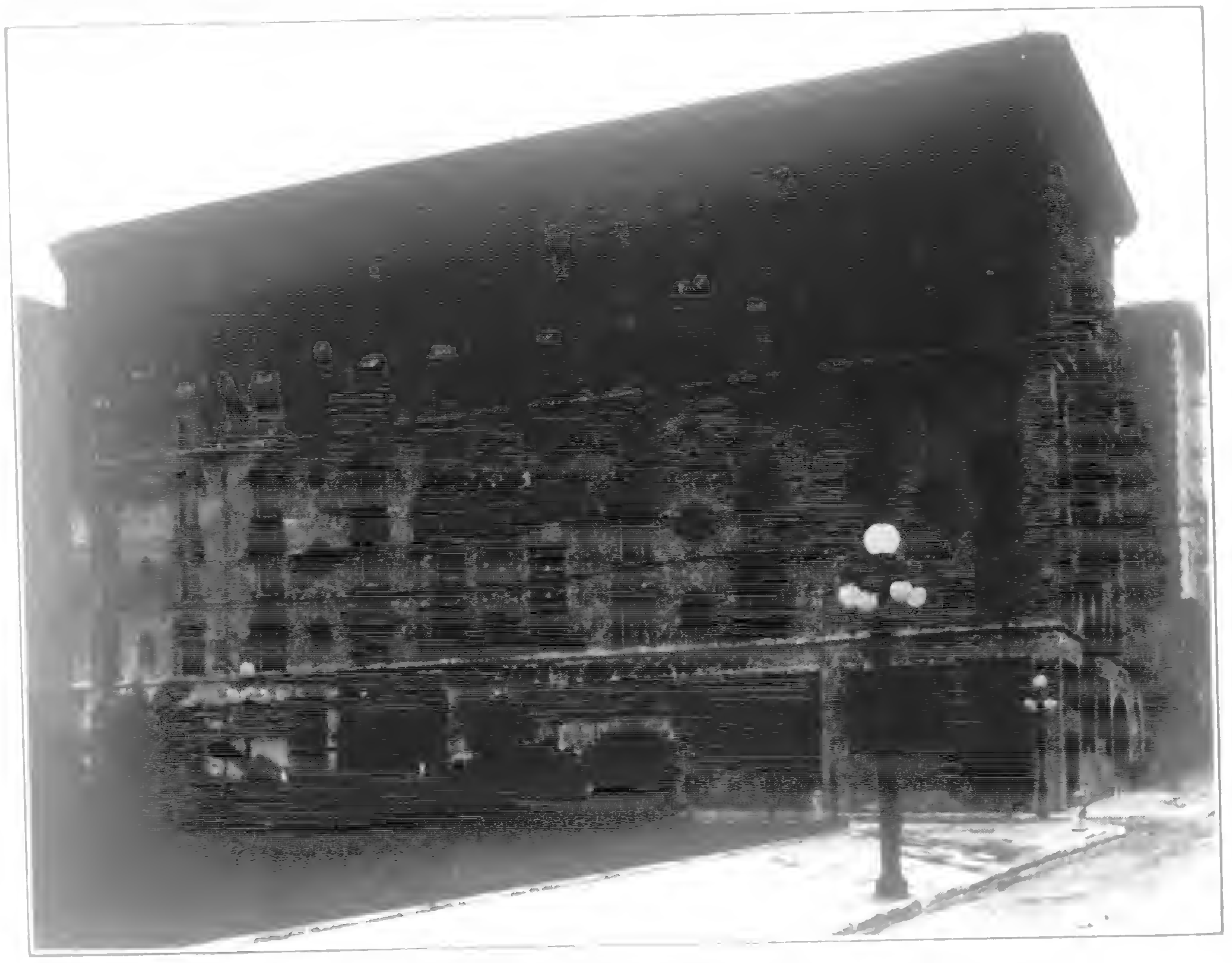
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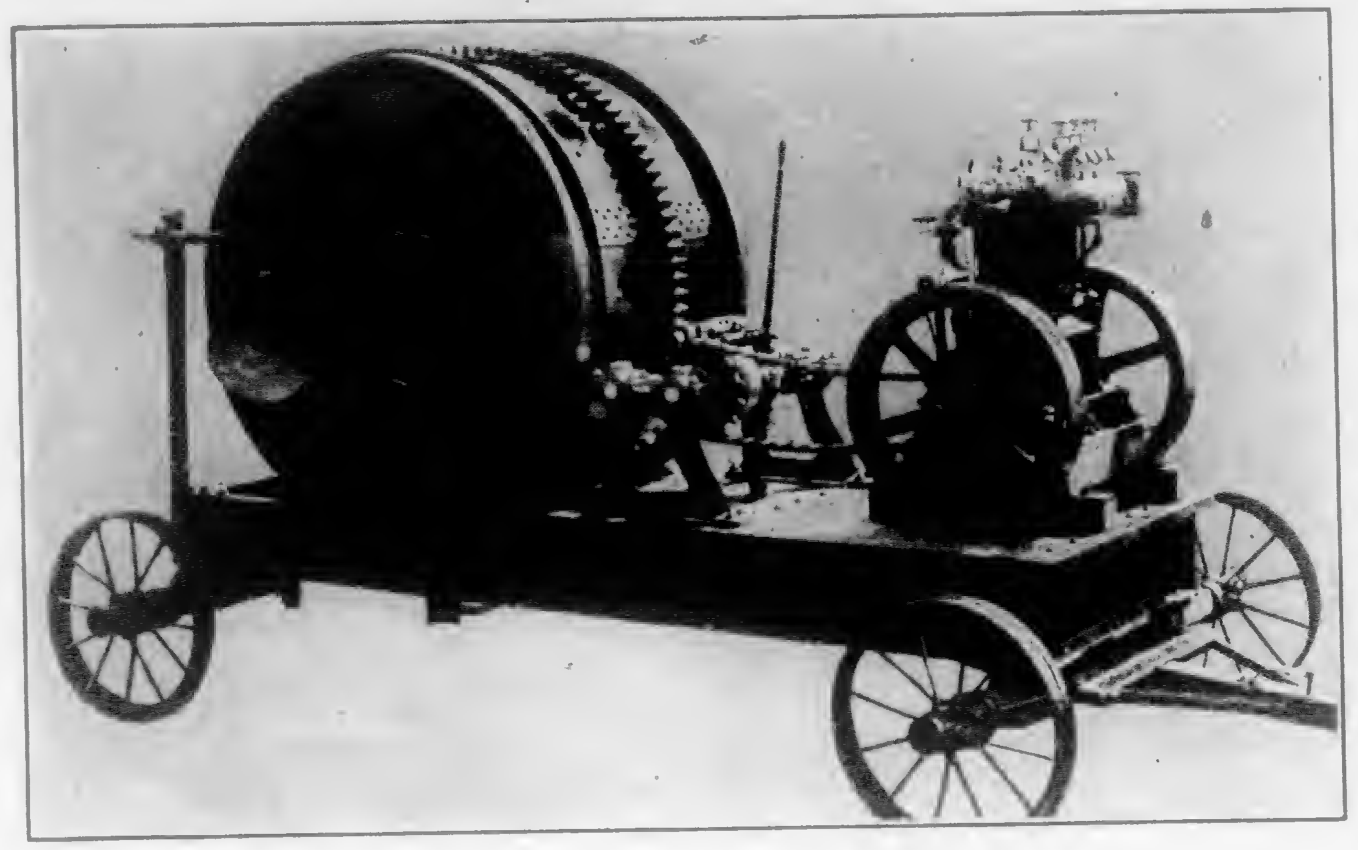
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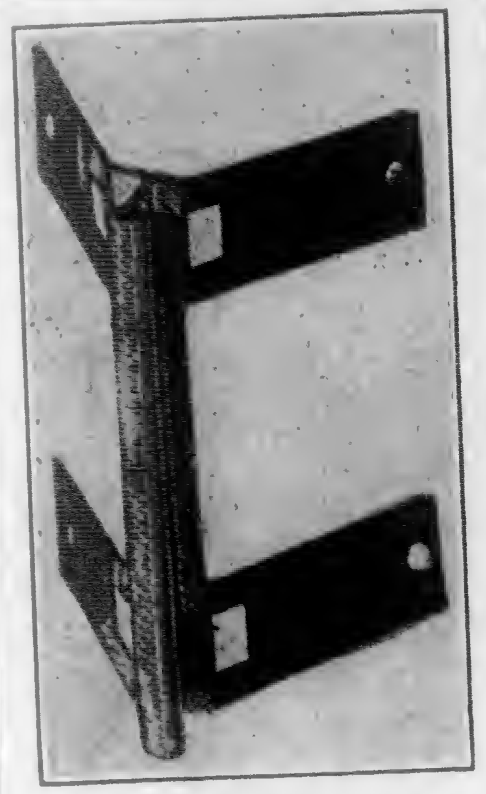
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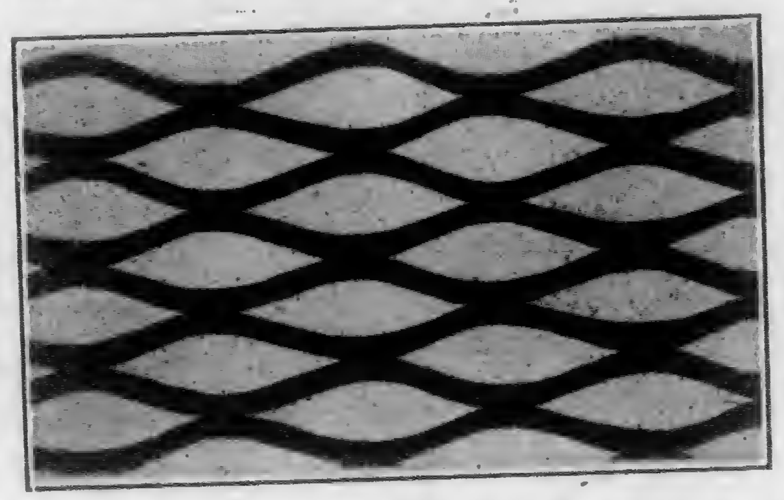
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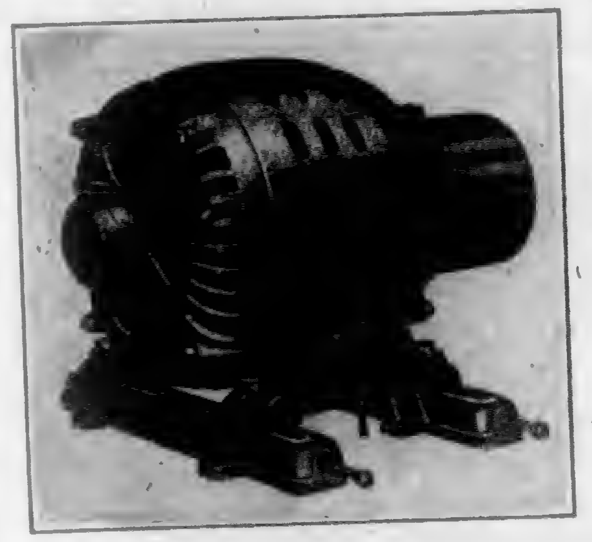
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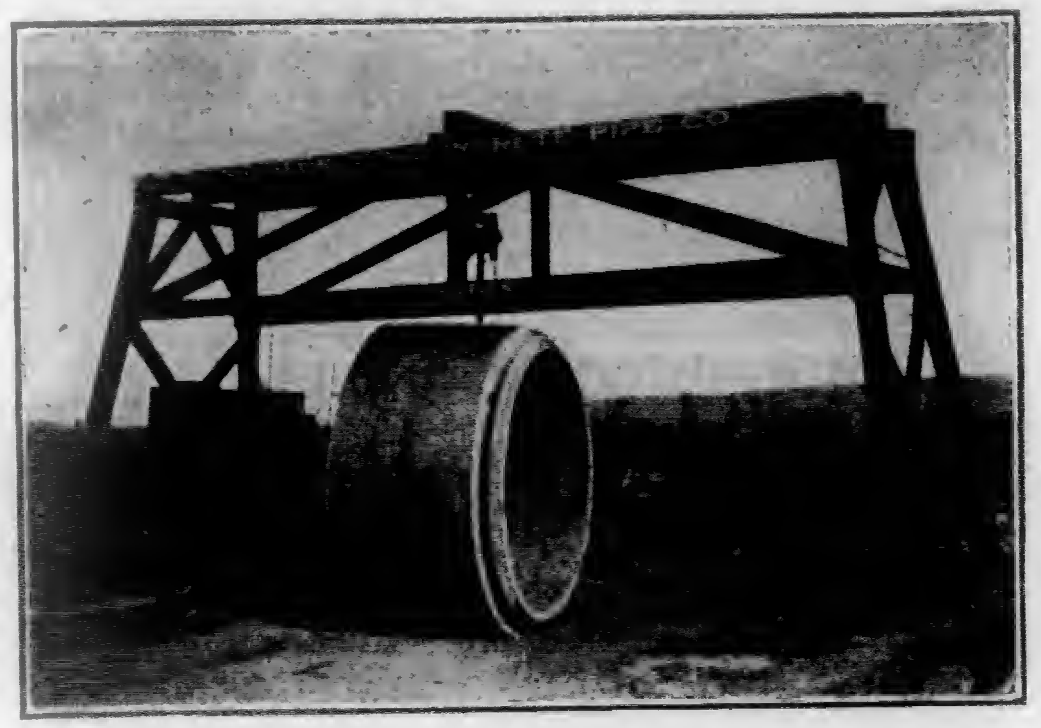
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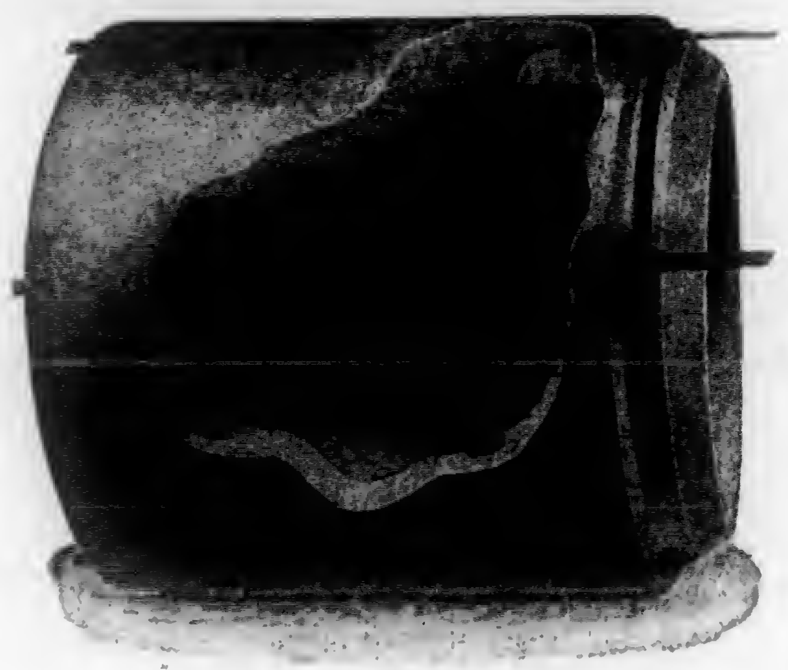


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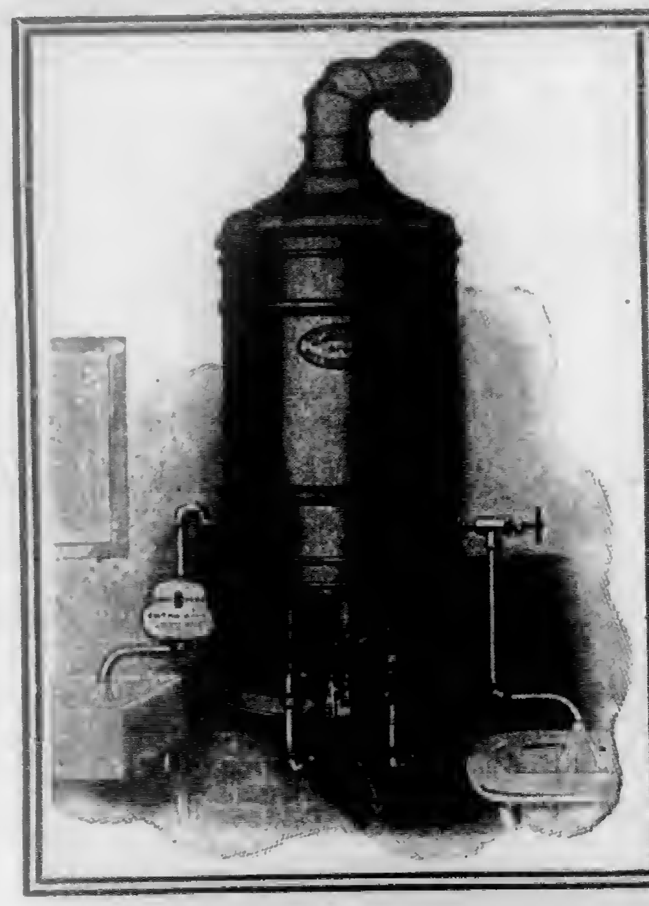
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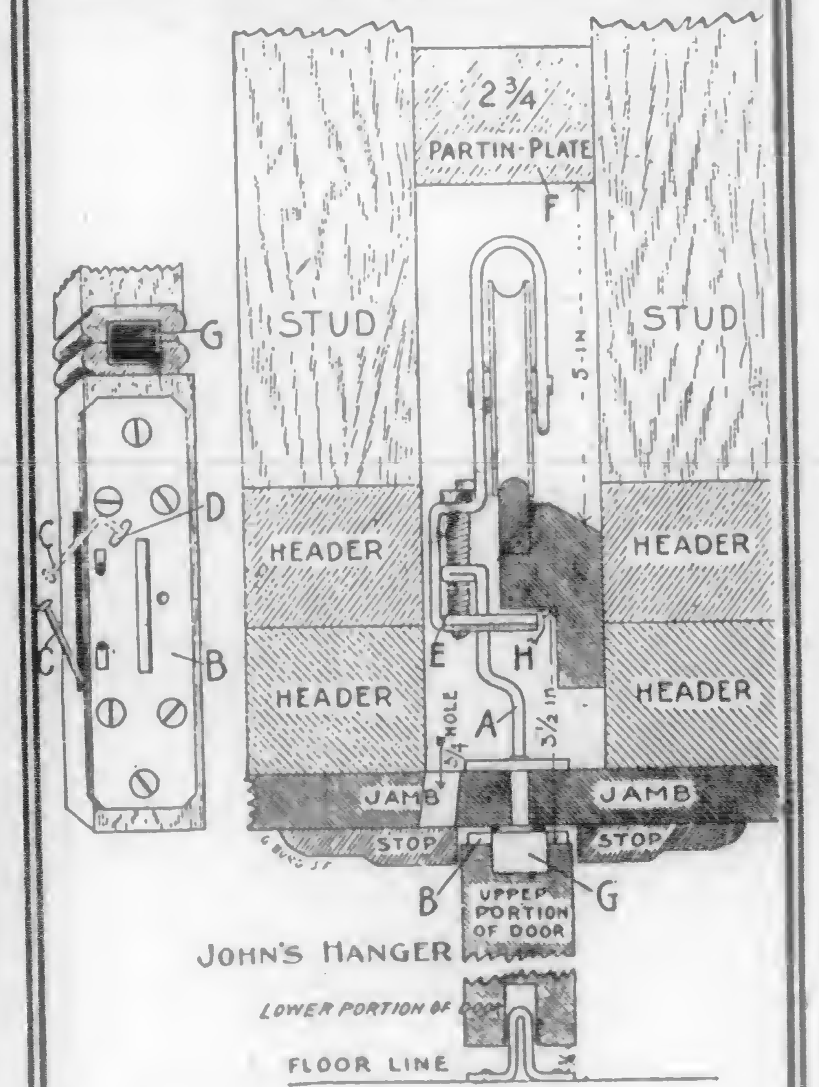
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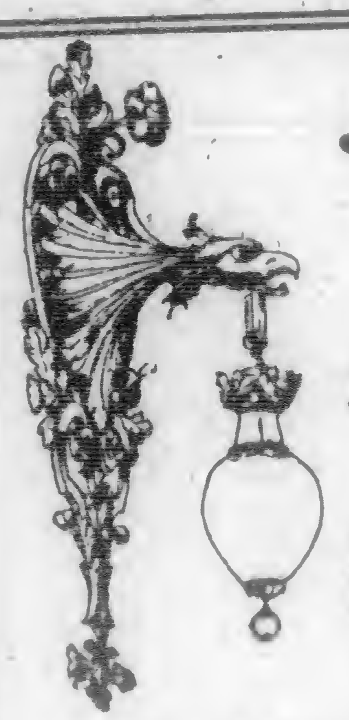
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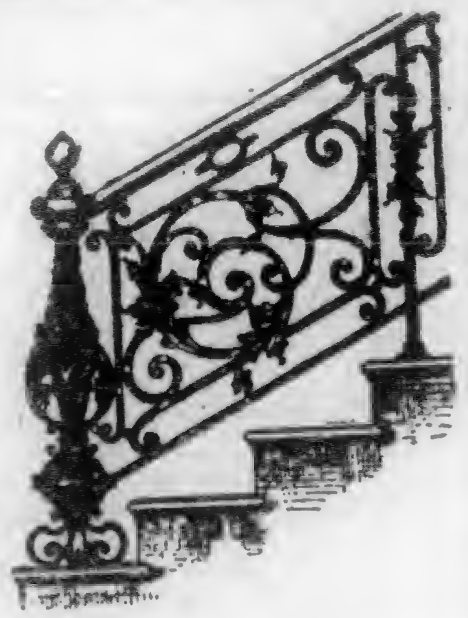
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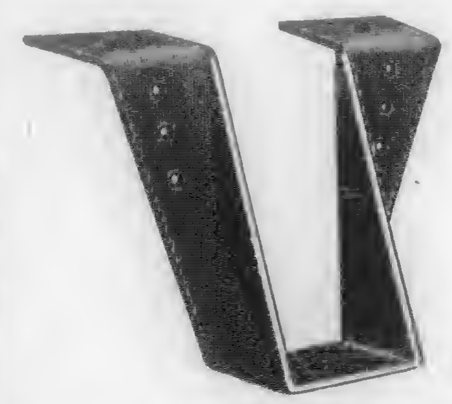
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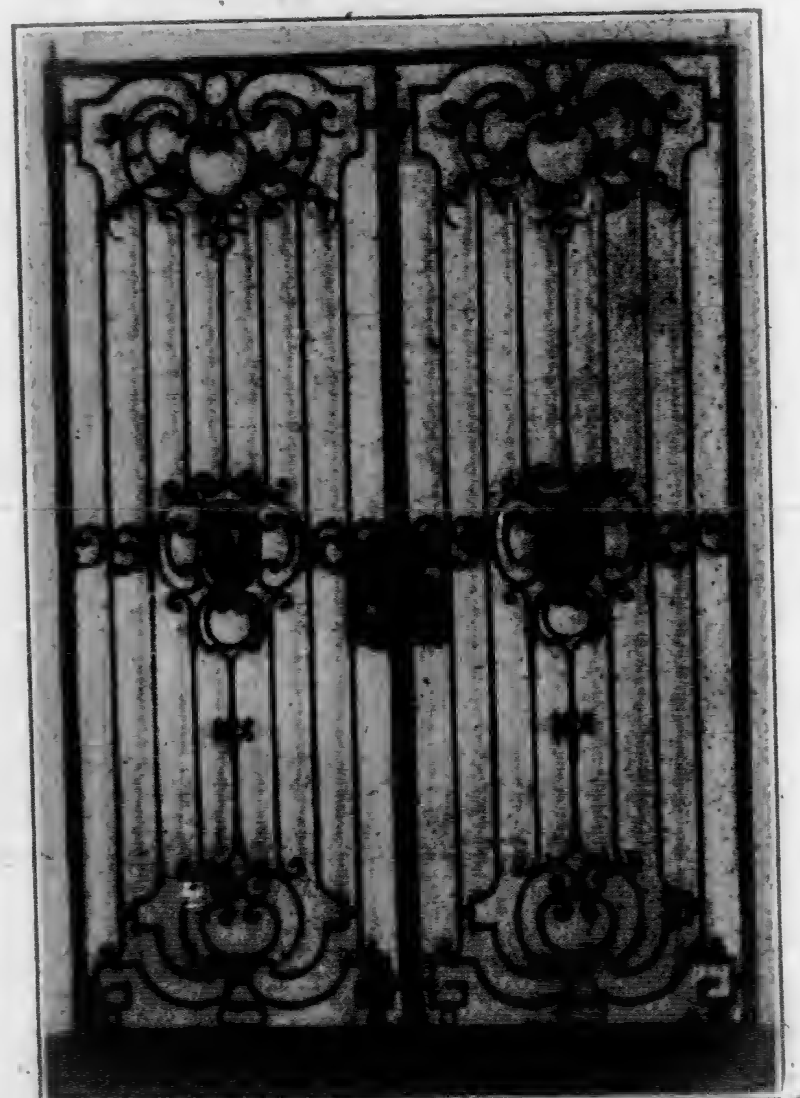
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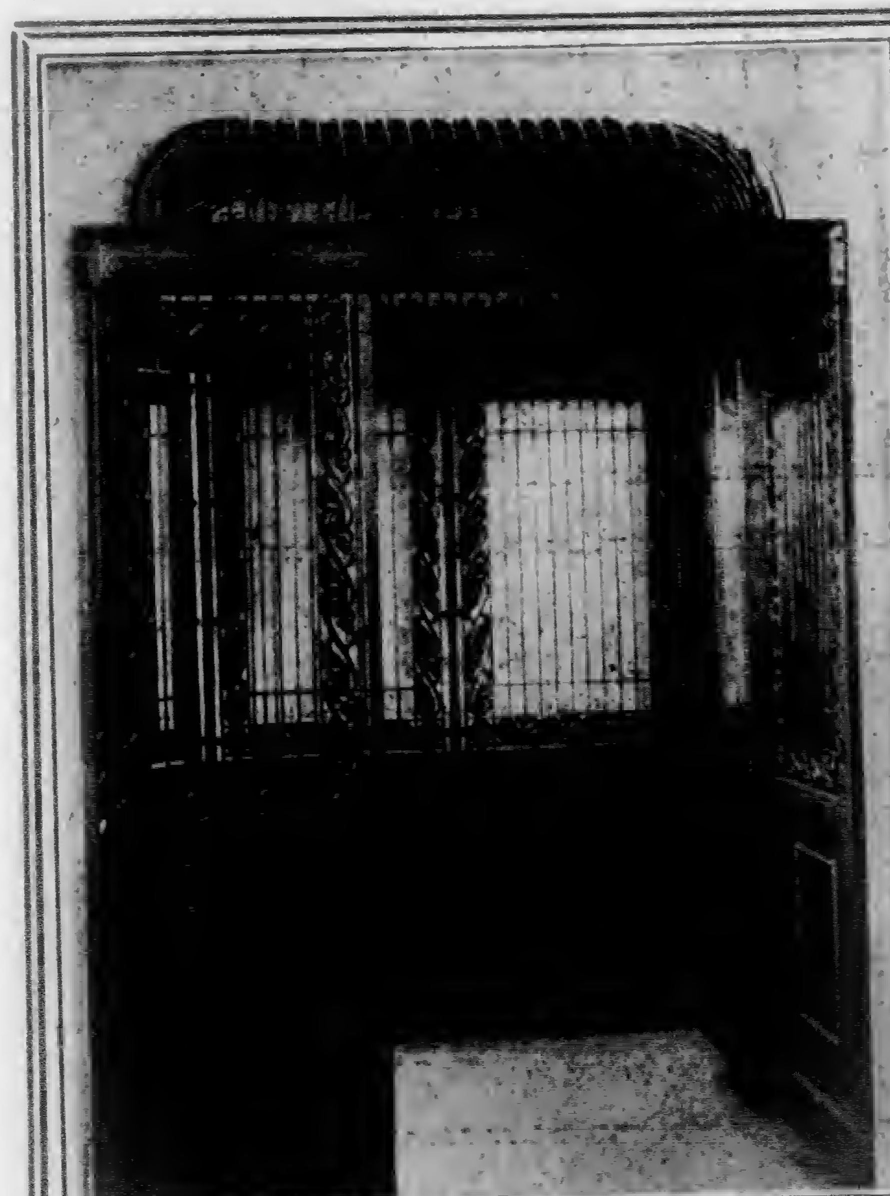
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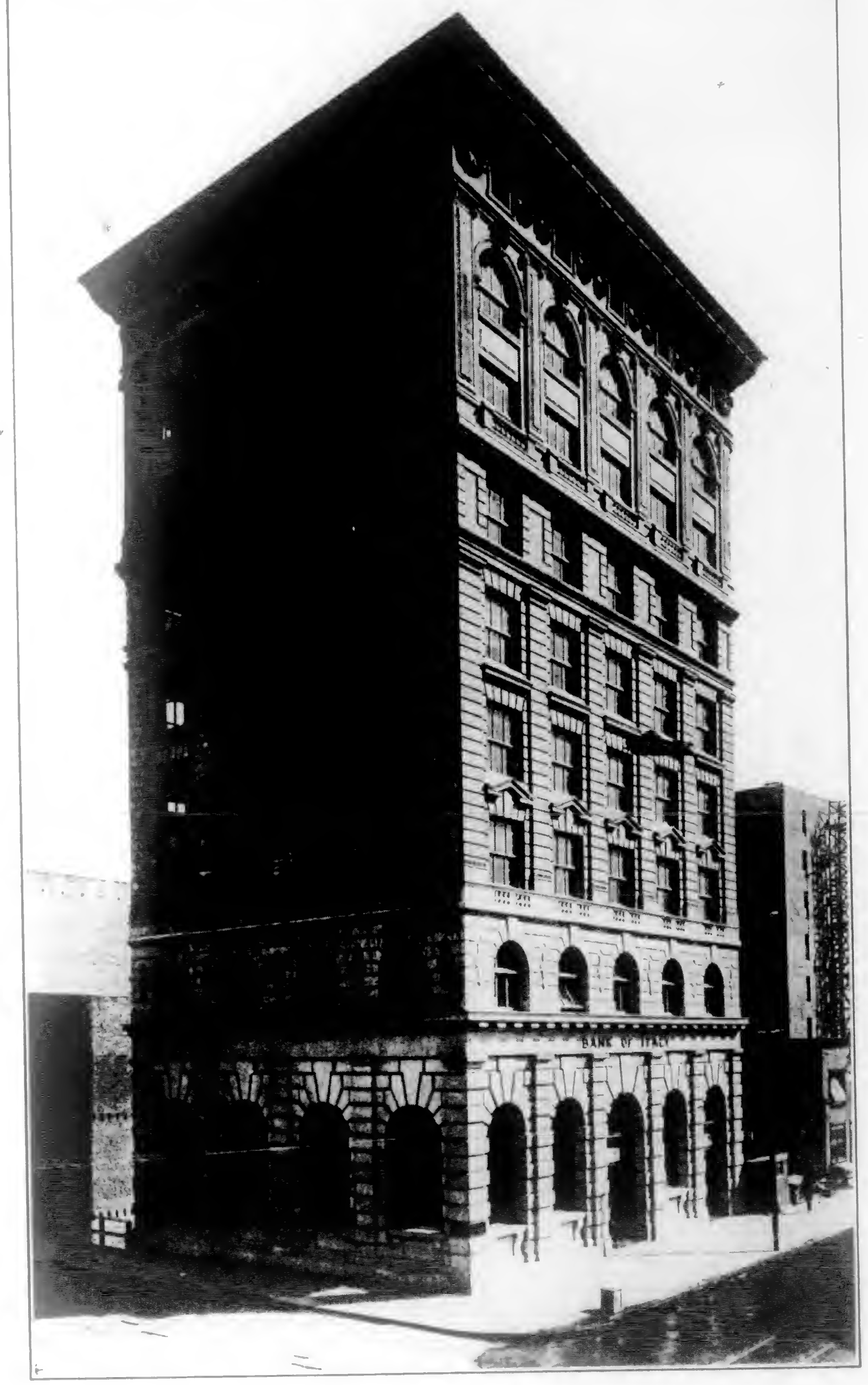
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Contents for May

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Bank of Italy Building, San Francisco
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Frontispiece,
The Architect and Engineer of California
May, 1909

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XVII. MAY, 1909. No. 1.

Recent Architectural Work of Frank T. Shea and John O. Lofquist



Detail of Entrance, Mission Dolores Hall, San Francisco

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Among the commercial buildings erected in San Francisco since the big fire, none has attracted more attention or received greater praise than the Bank of Italy building, a splendid Class A structure of nine stories and which was designed by Messrs. Shea and Lofquist in competition with a dozen leading architects.

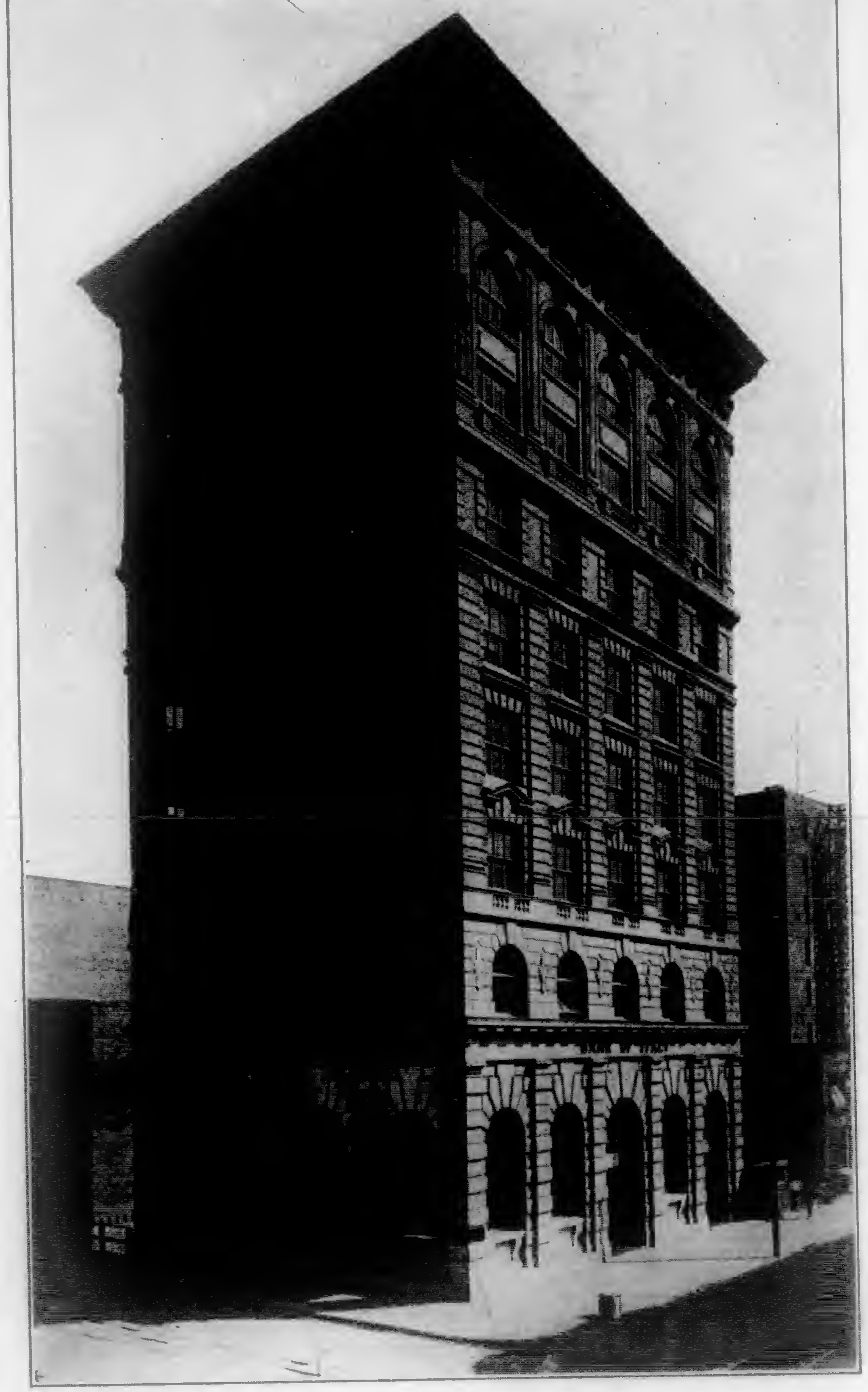
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The perspective of the Mission Dolores Church is a striking example of true Mission architecture. The architects have successfully retained the several features which the Mission fathers introduced in the old abode buildings and have studiously avoided embellishment or enlargement of the simple lines which have made the Mission architecture a distinctive and altogether picturesque type in California buildings.

St. Joseph's Church in Berkeley is an exceedingly good example of classical architecture.

The St. Mary's Hospital, a Class A steel building, with reinforced concrete curtain walls, is to be the most up-to-date hospital on the Coast, if not in the United States.

Mr. Lofquist became associated with Mr. Shea about the time of the fire in 1906, coming to San Francisco from New York city.



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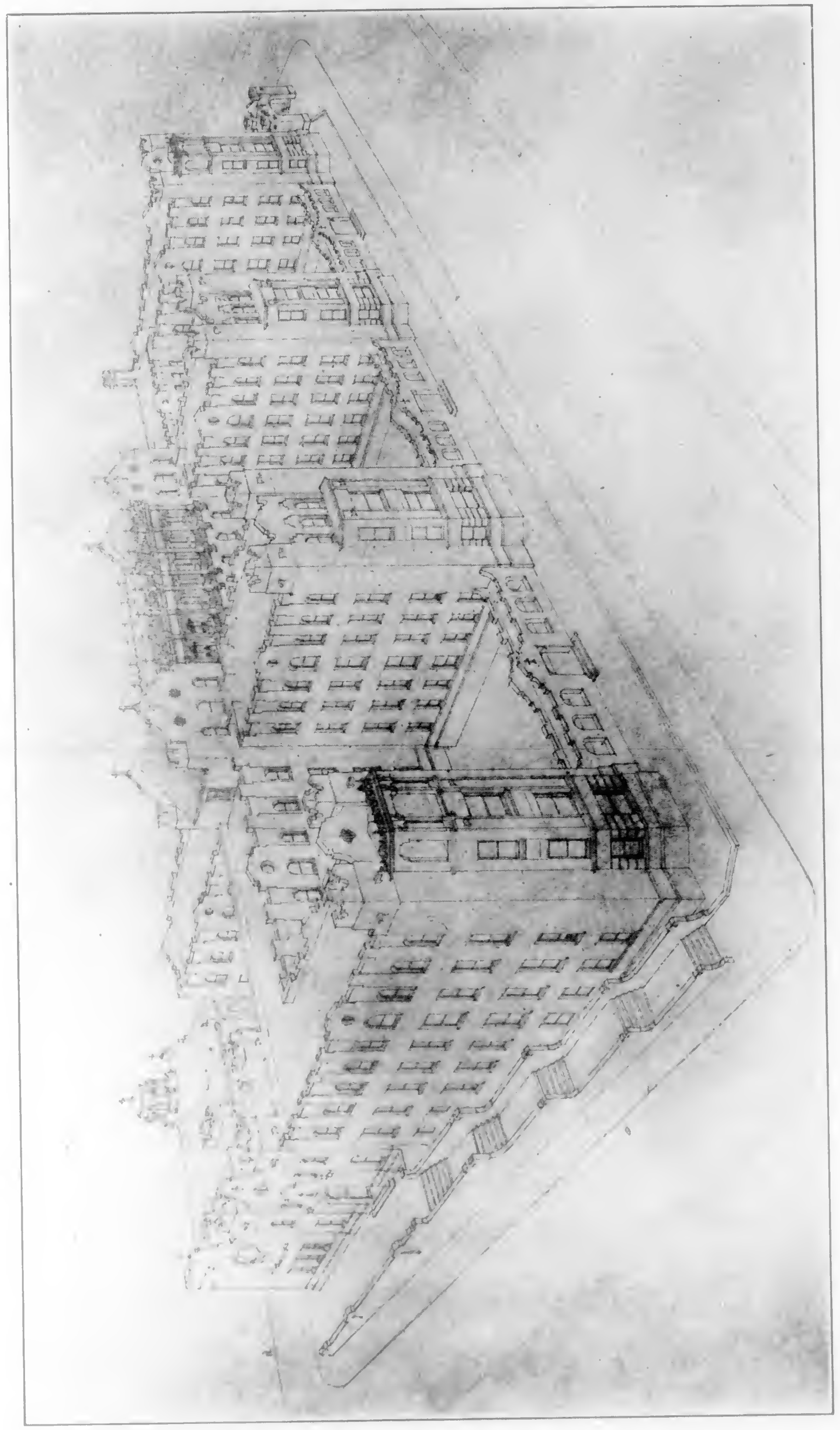
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Marble work by Joseph Musto Sons-Keenan Co. Ornamental ceiling by Callahan & Manetta
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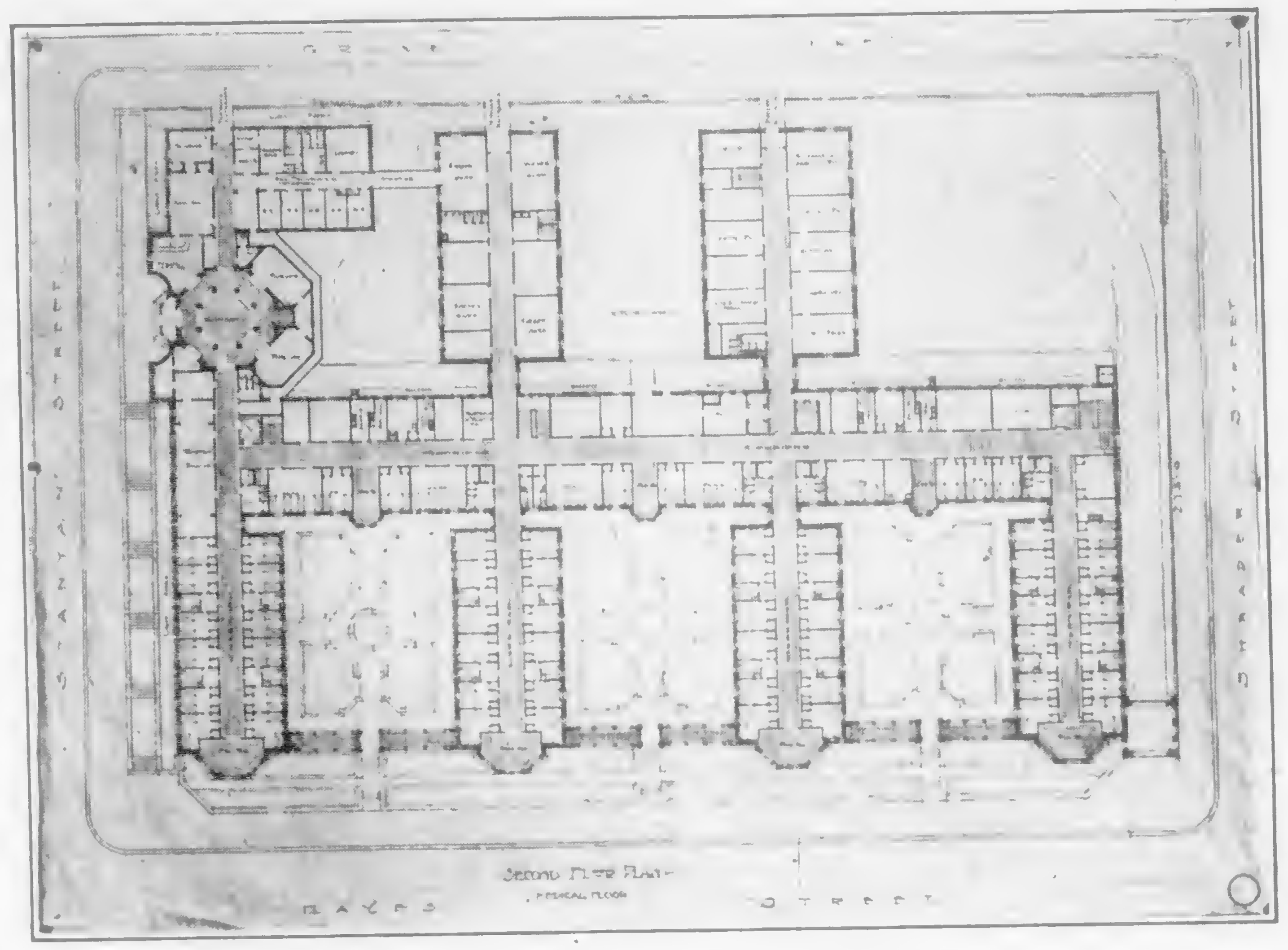
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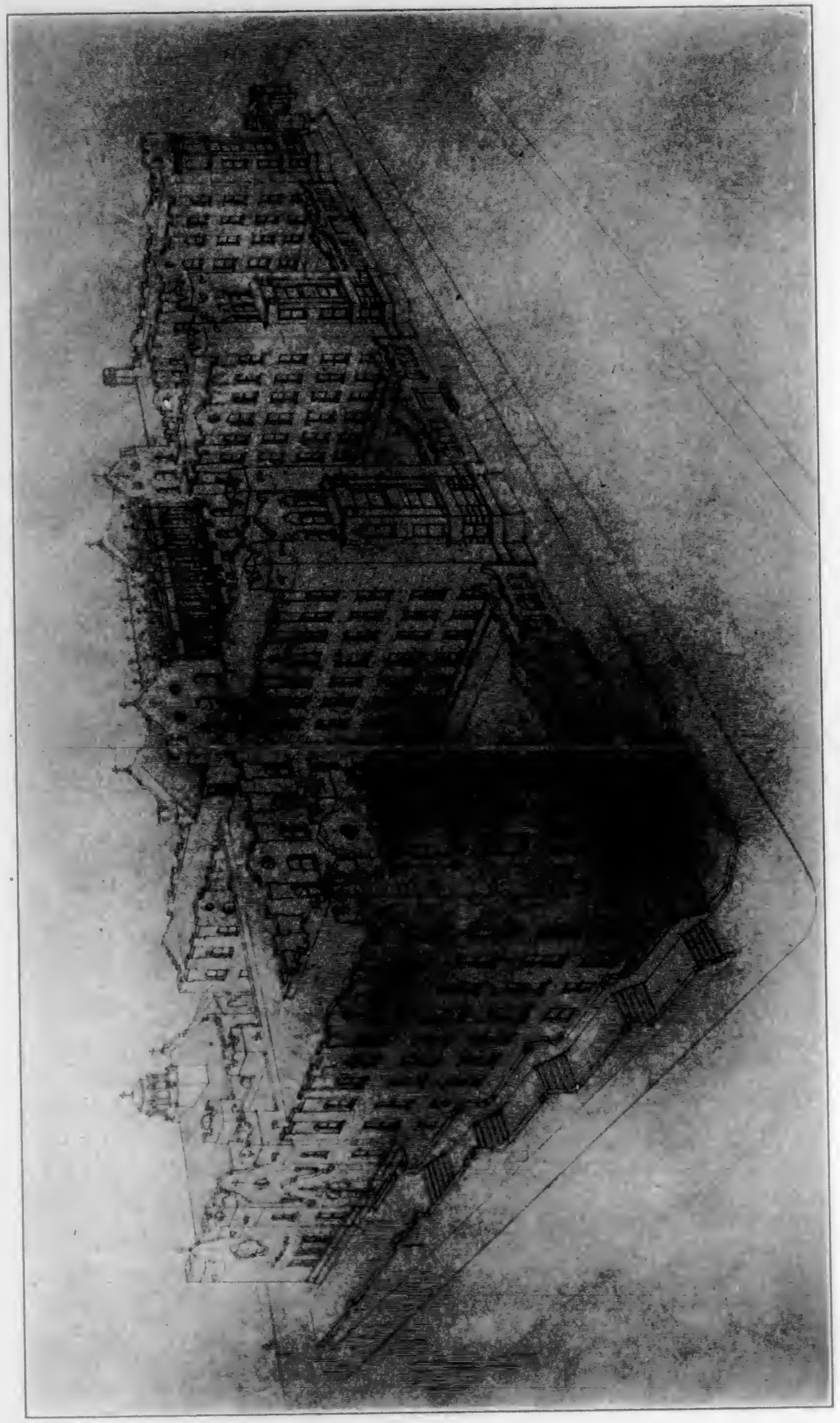
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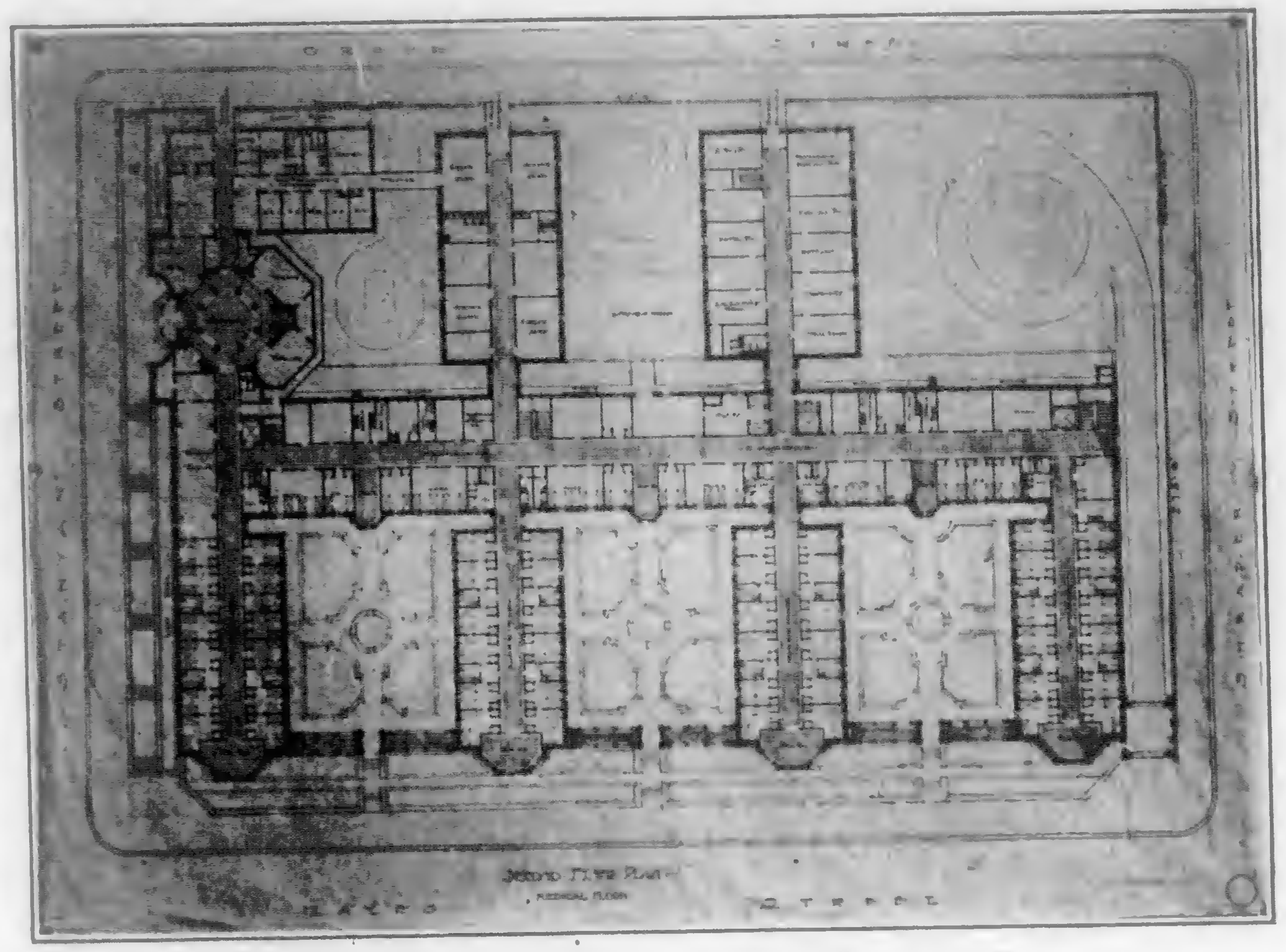
Block Plan St. Mary's Hospital, San Francisco
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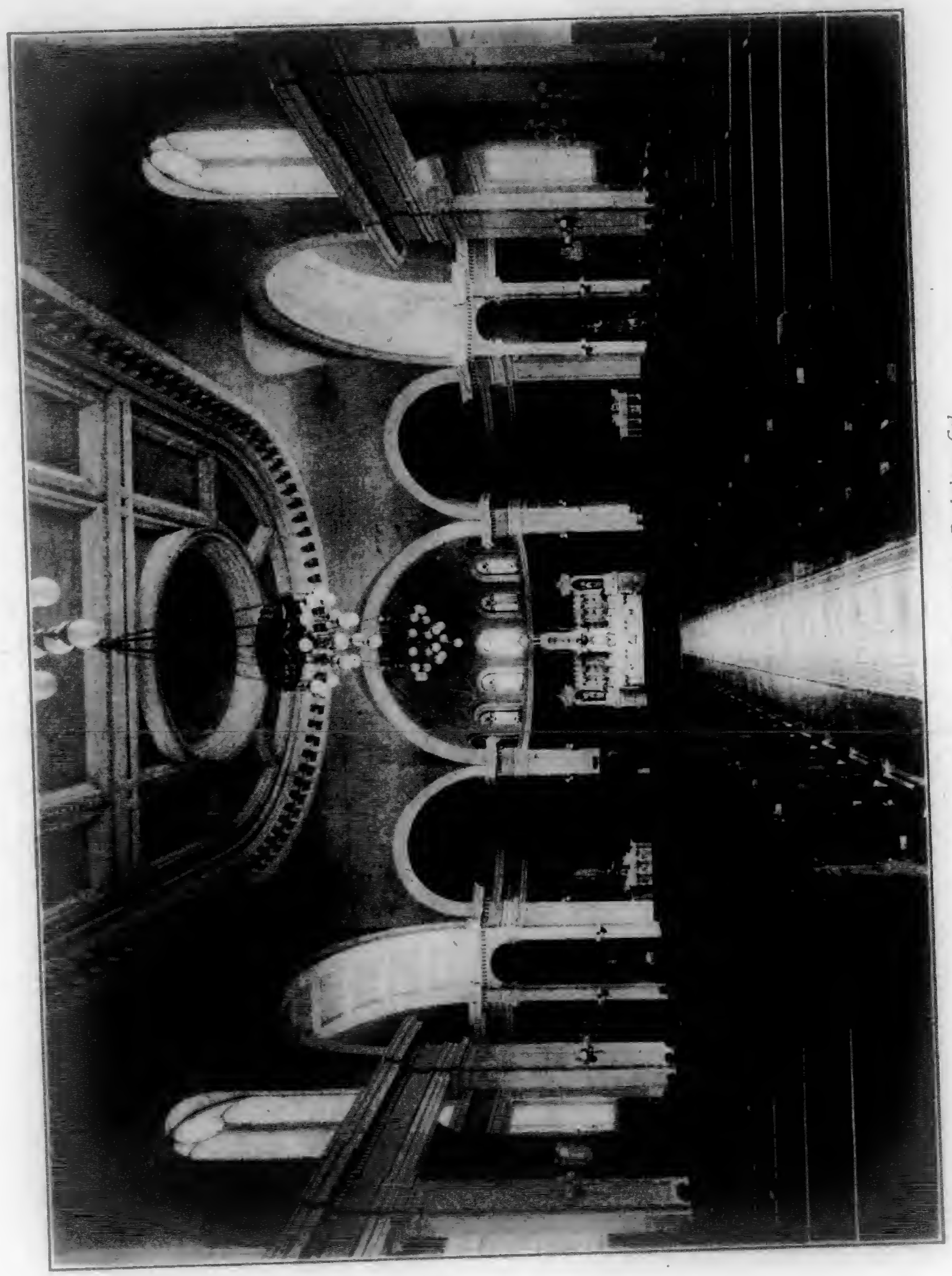
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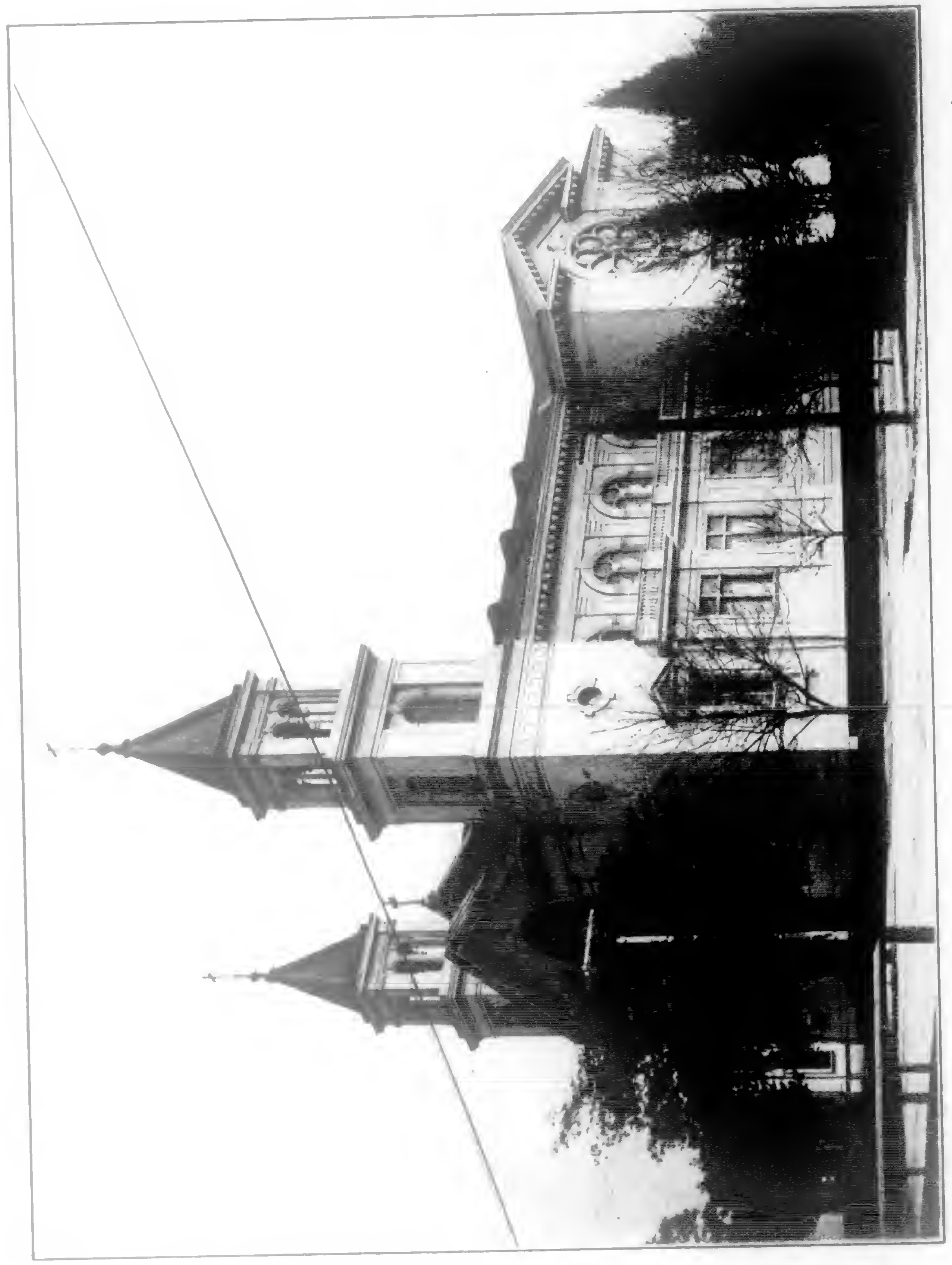
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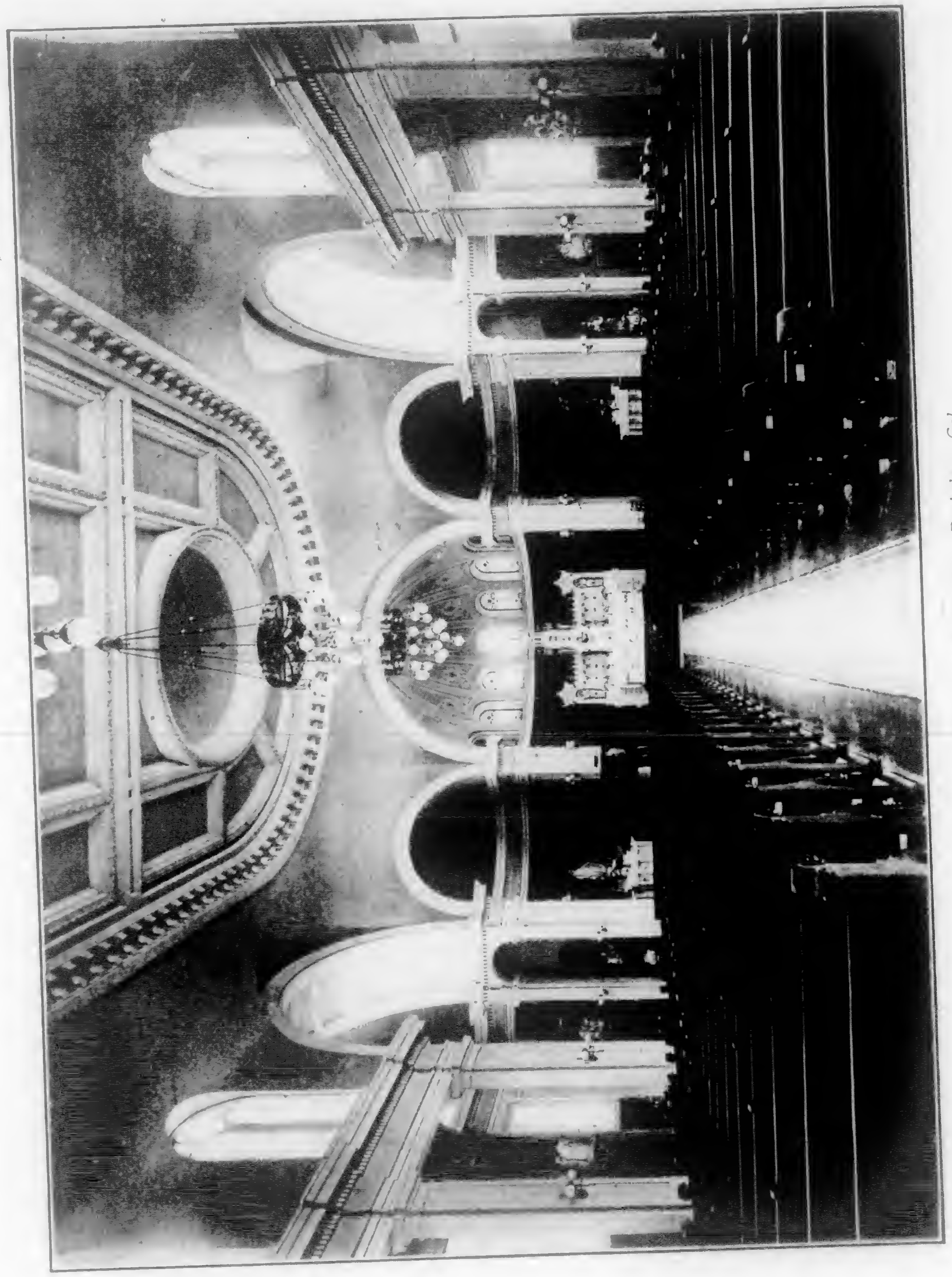
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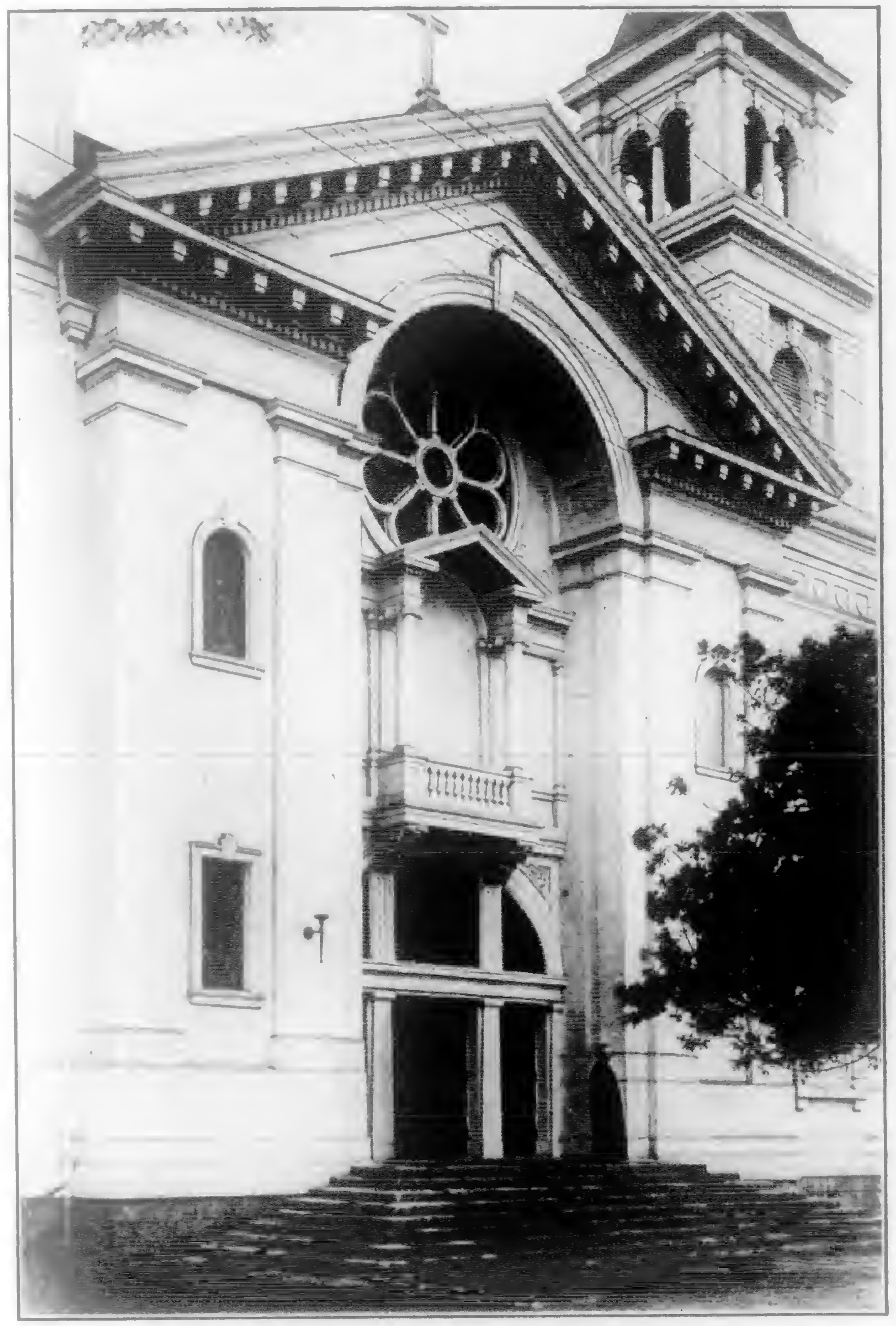
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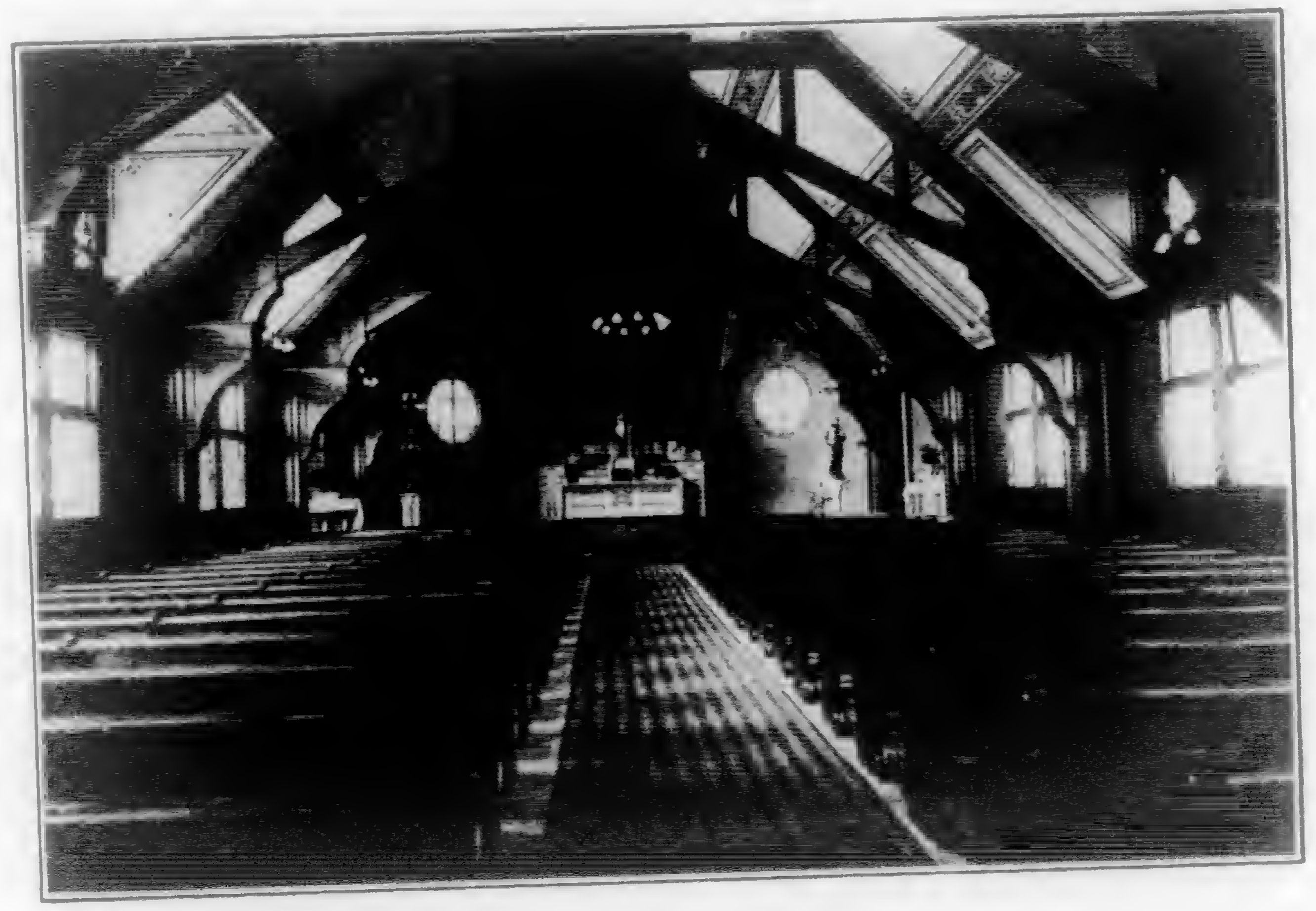
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Interior St. Anselm's Church
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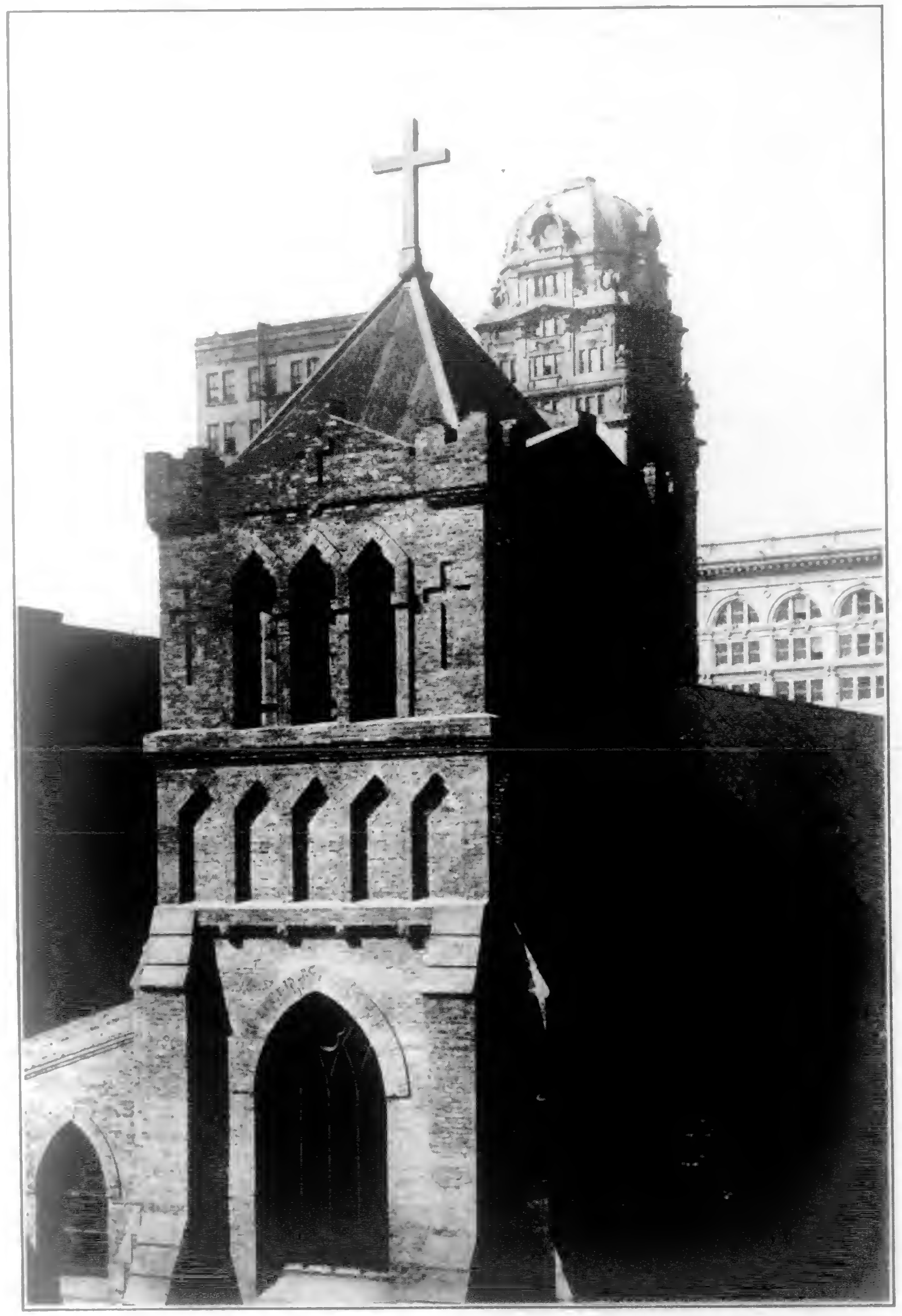
Detail of Entrance, St. Joseph's Church, Berkeley, Cal.
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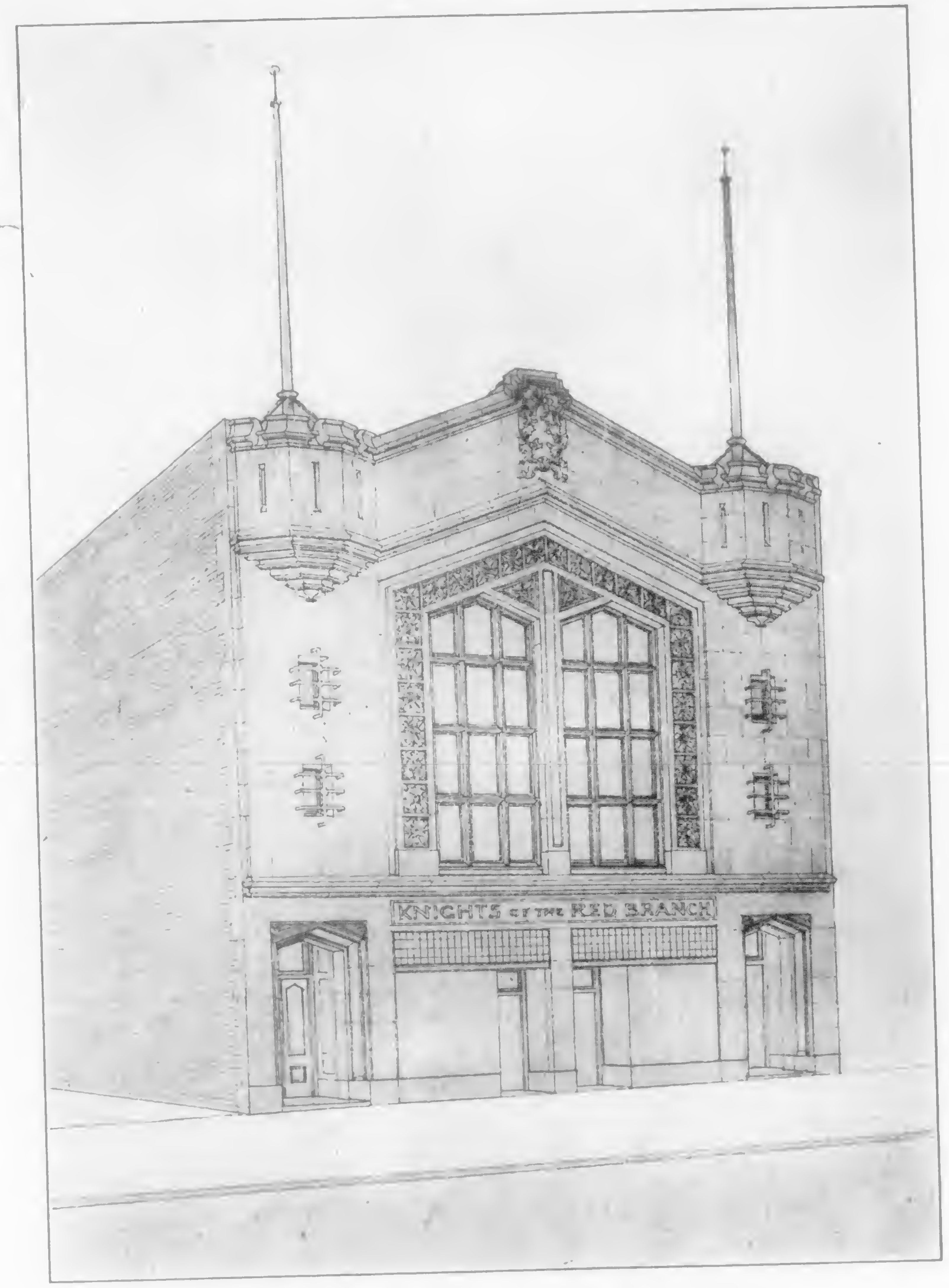
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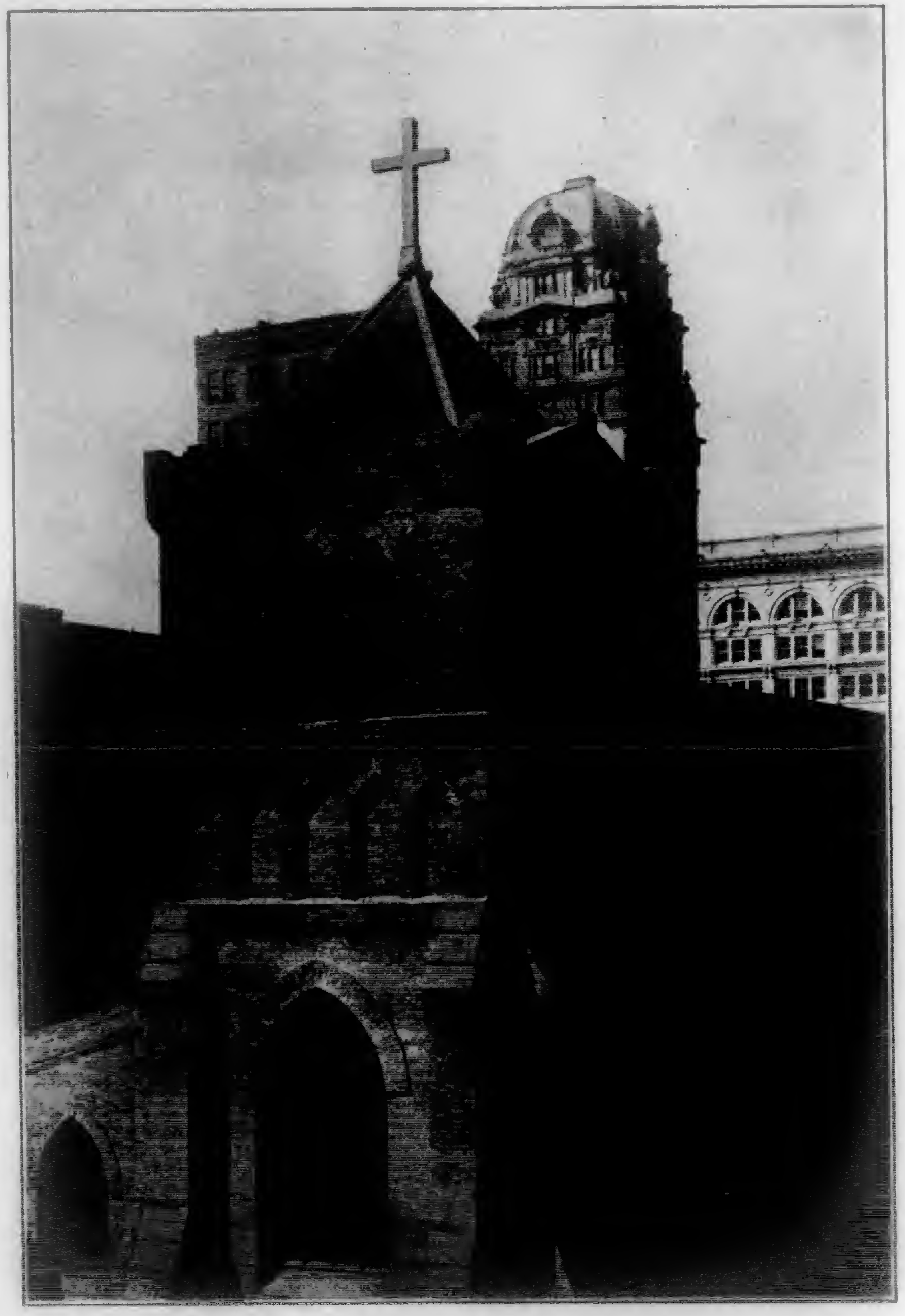
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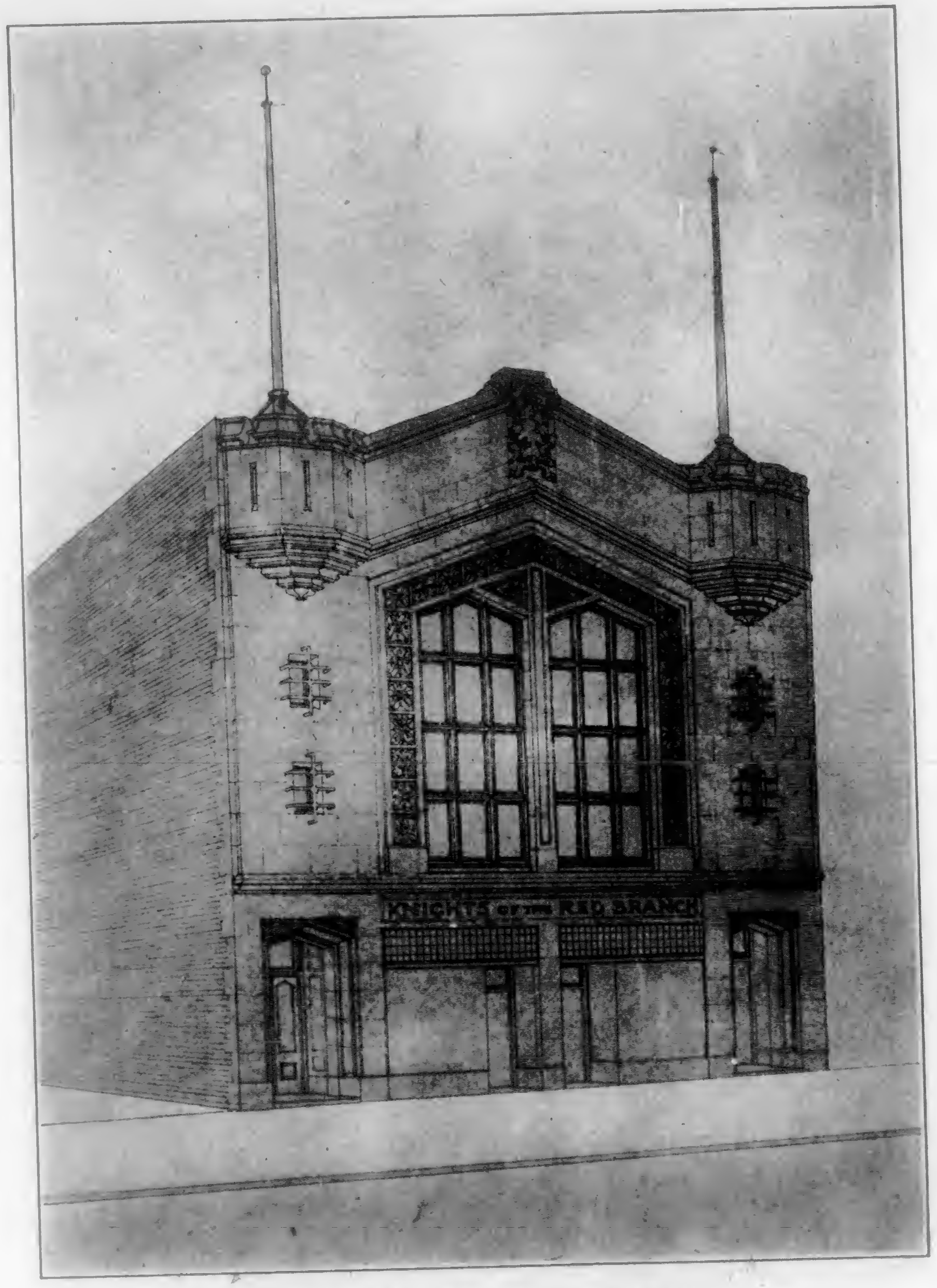
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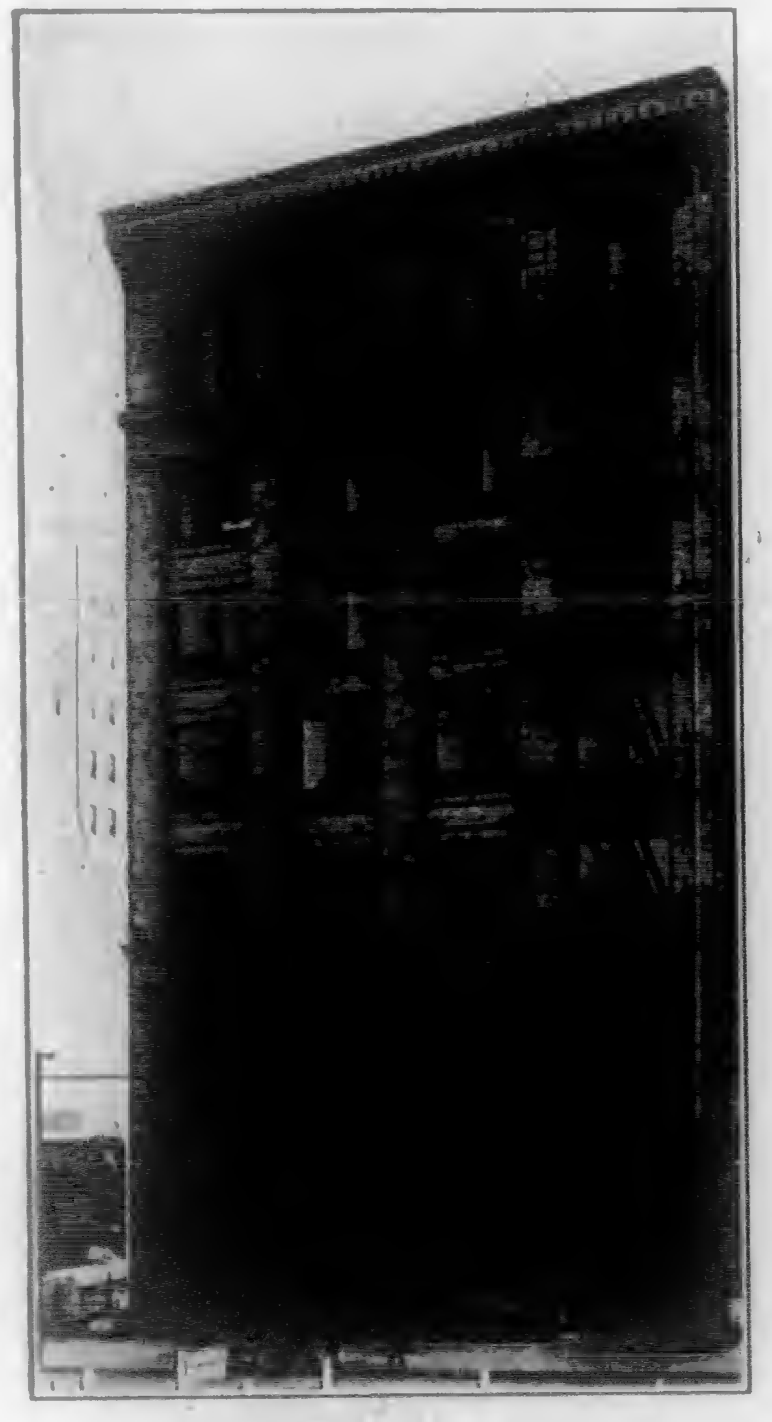
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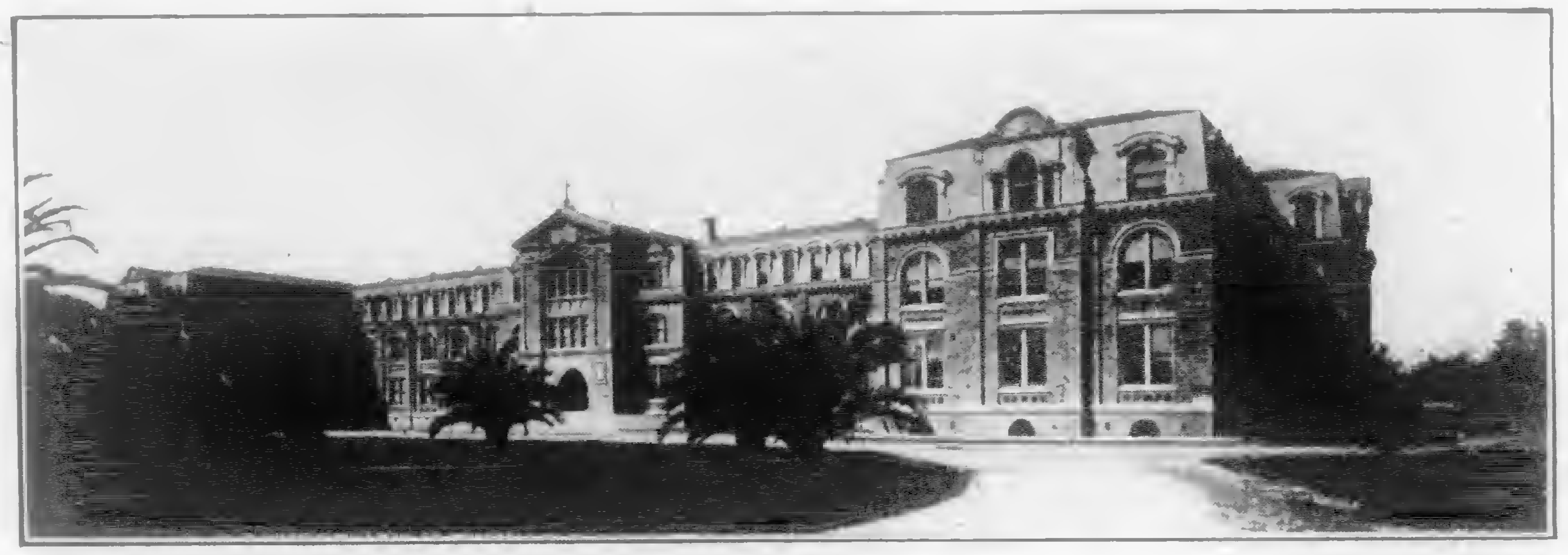
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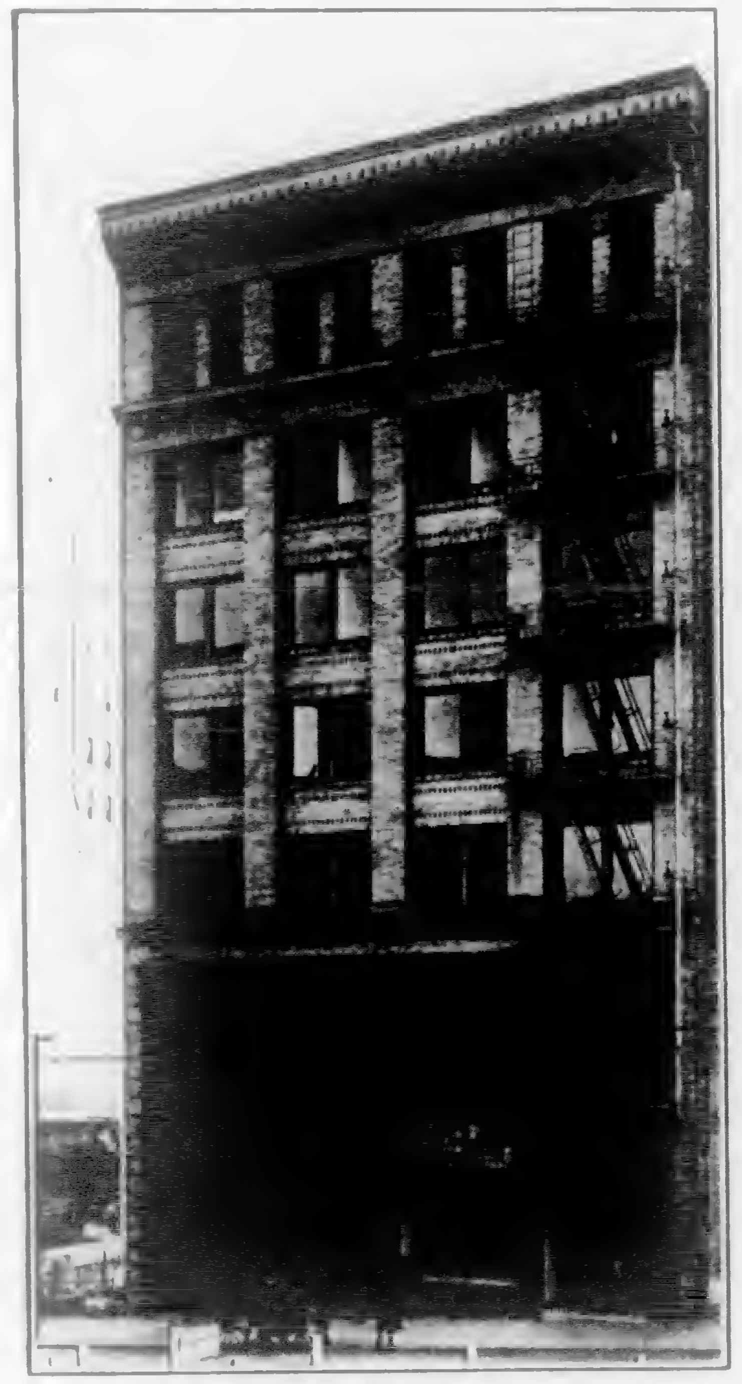
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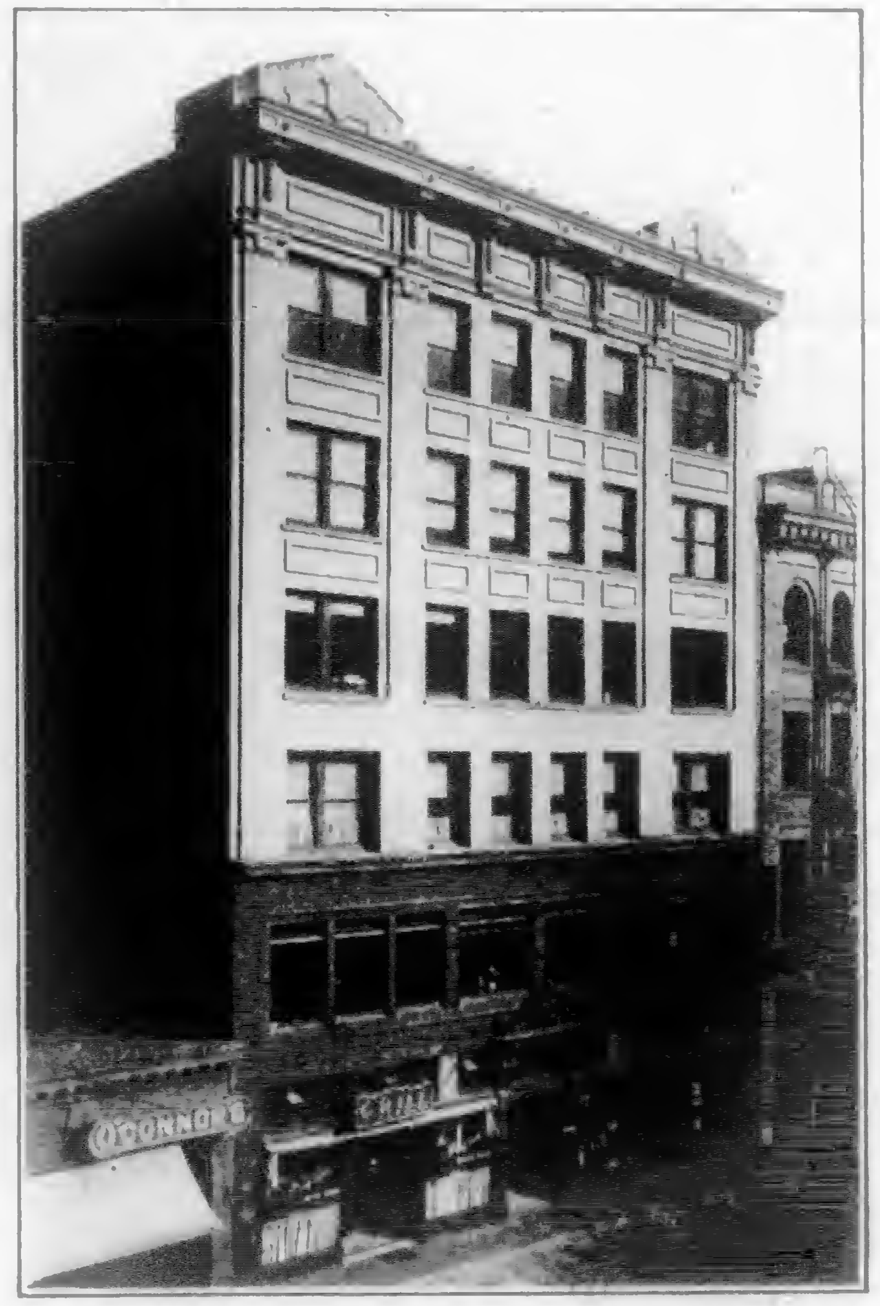
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Tower, Mission Dolores Hall,
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Entrance Mission Dolores Hall, San Francisco
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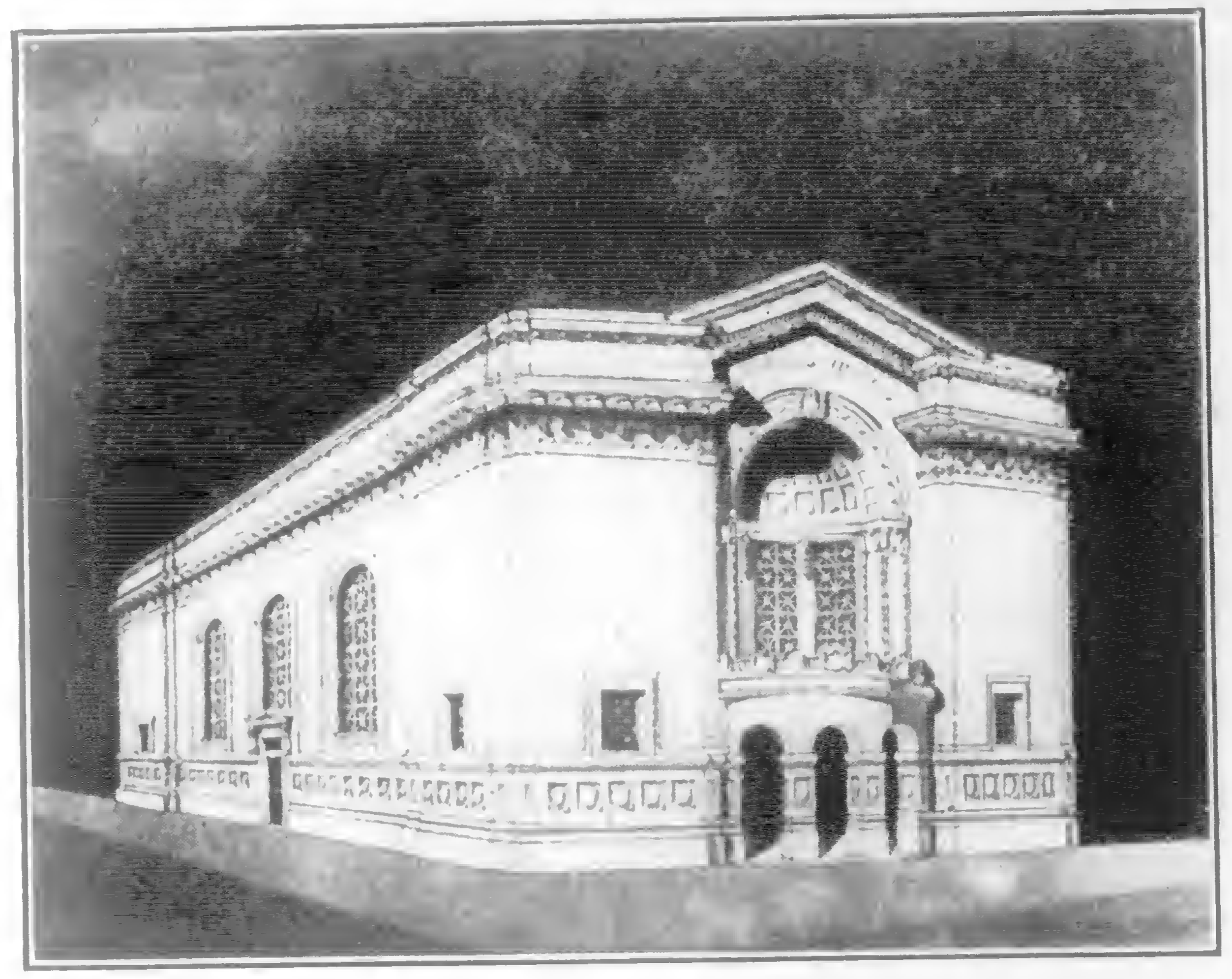
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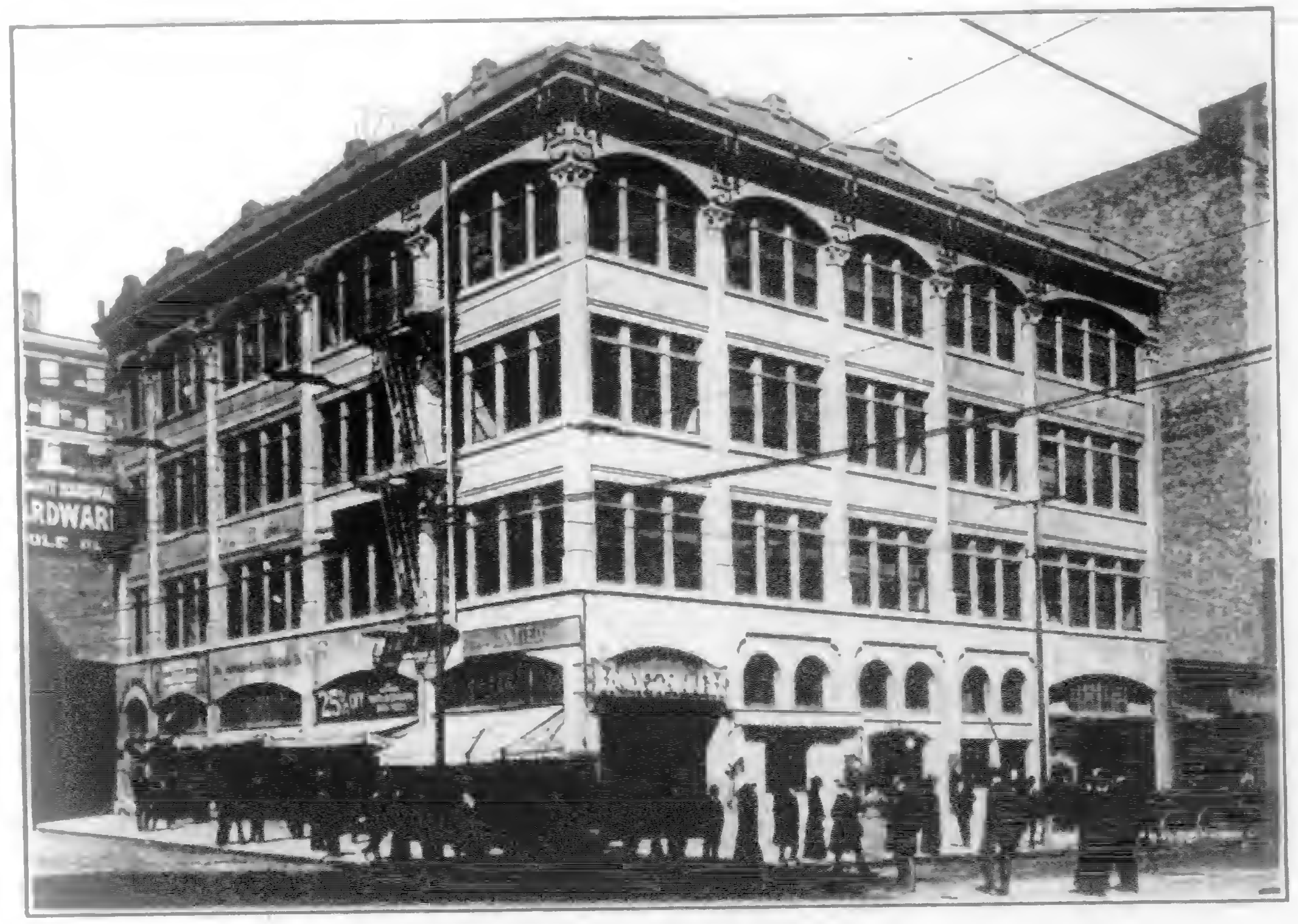
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Competitive Design for Union Trust Building, San Francisco
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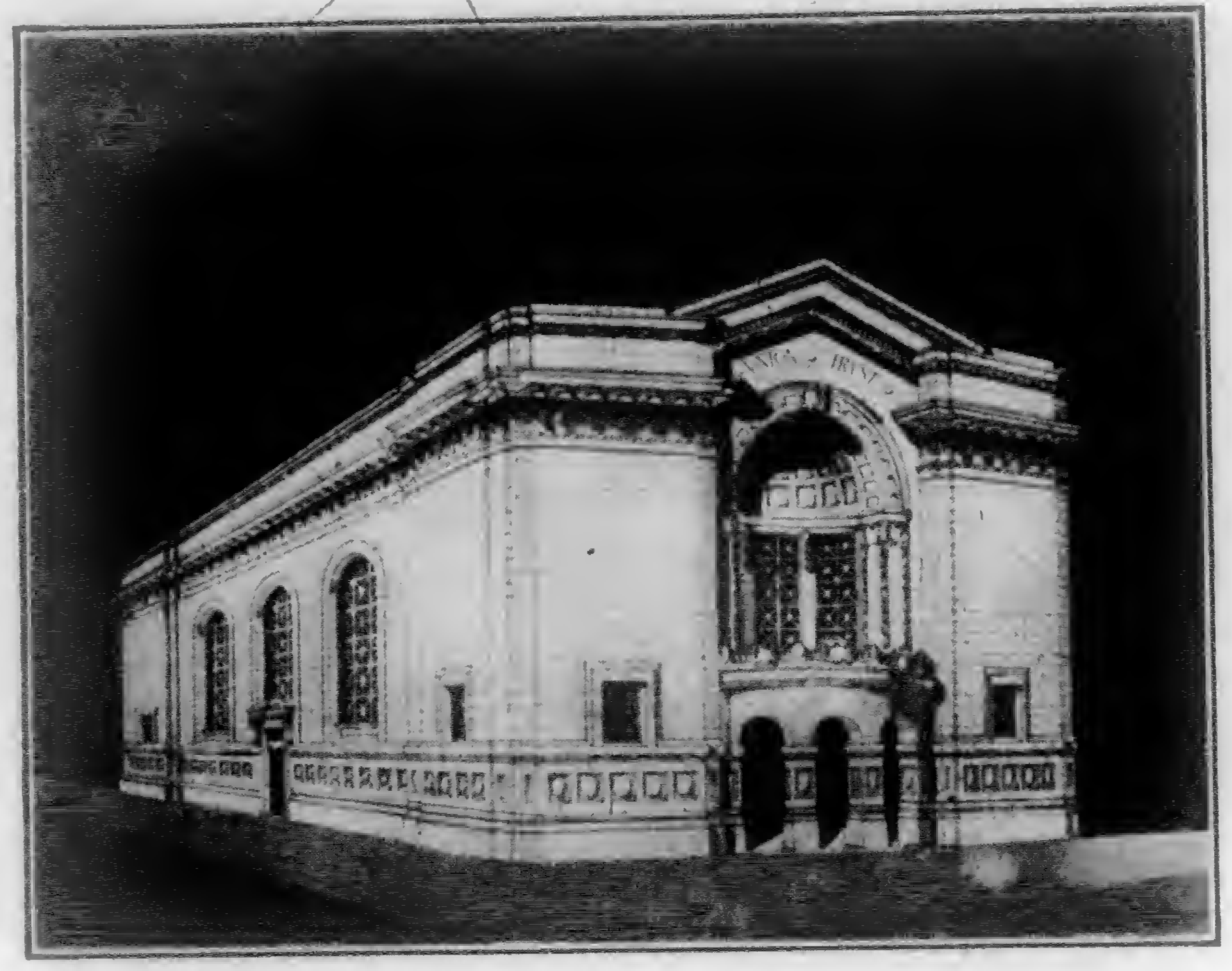
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Prevention of Dampness in Cellars

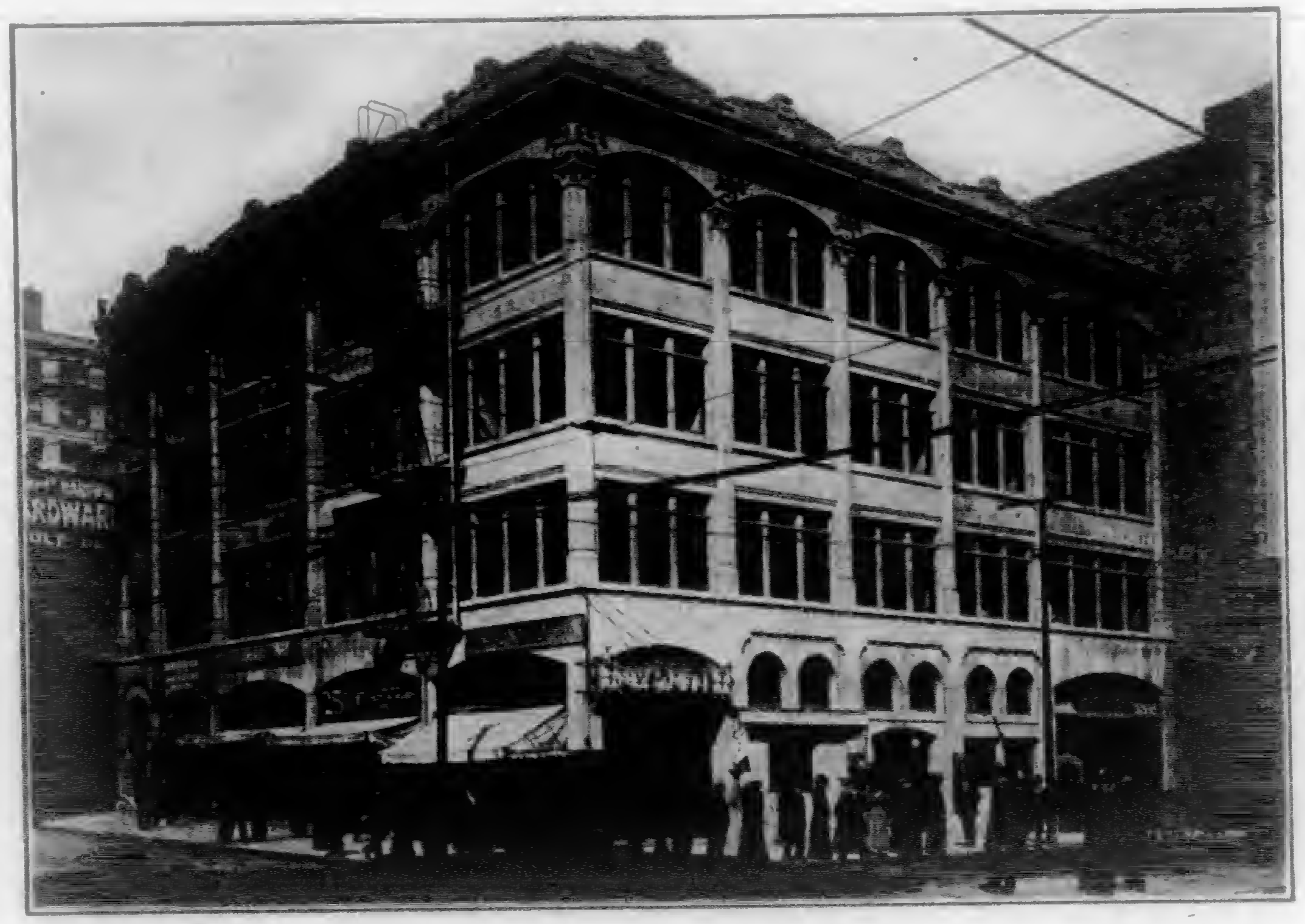
DAMPNESS is the chief enemy of mankind. Where there is dampness there is decay, where there is decay there is disease, where there is disease there is death. Eliminate dampness, says G. W. Kirwin in Waterproofing, and fully one-half of the ills that flesh is heir to disappear. Those who have or are told that they have the germs of disease go to sections of the country where there is little or no rain and water is at a premium, while low lying, ill-drained, swampy regions are the abodes of fever, ague, rheumatism and consumption.

Foul odors in houses that have been kept closed for a time are invariably due to dampness. The odor is not dampness, but the evidence of dampness and the most common place for a dampness to accumulate is in cellars and basements. To be damp, it does not follow that water must collect in sufficient quantity to form pools and small streams in those parts of the building constructed below the surface of the ground. Moisture is continually coming through, and the warmth of the rooms above creates a draft that draws the cellar air—impregnated with odors—up into the house, producing that damp, unaired smell that is not only very unpleasant, but injurious to the health of the occupants of the building.

One often hears that "good drainage" is the one thing needful, but while good natural and artificial drainage are by no means to be despised—indeed, they are essential to the welfare of human beings—they do not counteract the natural tendency of moisture that is in the ground, even



Competitive Design for Union Trust Building, San Francisco
Frank T. Shea and John O. Lofquist, Architects



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Union Square Hotel, San Francisco
Equipped with Van Emon Elevators *Frank T. Shea and John O. Lofquist, Architects*

Prevention of Dampness in Cellars

DAMPNESS is the chief enemy of mankind. Where there is dampness there is decay, where there is decay there is disease, where there is disease there is death. Eliminate dampness, says G. W. Kirwin in Waterproofing, and fully one-half of the ills that flesh is heir to disappear. Those who have or are told that they have the germs of disease go to sections of the country where there is little or no rain and water is at a premium, while low lying, ill-drained, swampy regions are the abodes of fever, ague, rheumatism and consumption.

Foul odors in houses that have been kept closed for a time are invariably due to dampness. The odor is not dampness, but the evidence of dampness and the most common place for a dampness to accumulate is in cellars and basements. To be damp, it does not follow that water must collect in sufficient quantity to form pools and small streams in those parts of the building constructed below the surface of the ground. Moisture is continually coming through, and the warmth of the rooms above creates a draft that draws the cellar air—impregnated with odors—up into the house, producing that damp, unaired smell that is not only very unpleasant, but injurious to the health of the occupants of the building.

One often hears that "good drainage" is the one thing needful, but while good natural and artificial drainage are by no means to be despised—indeed, they are essential to the welfare of human beings—they do not counteract the natural tendency of moisture that is in the ground, even

in what is called "dry" ground, to find its way into openings whether they be cellars, basements, caves, mines or mausoleums.

Much thought and careful study and experimentation have been given to the subject of excluding dampness, from the antediluvian time when the patriarch Noah pitched the ark within and without, to the present day, and many methods have been placed on the market. Some of them have merit, while others do not stand investigation, either theoretically or practically. Some give good results when under ideal conditions, but fail when placed in the hands of men not having special skill and expert knowledge.

Acting on the principle that an ounce of prevention is worth a pound of cure, the time to damp-proof a building is while it is being erected. There is nothing difficult or complicated about using a good material to exclude moisture from buildings. It is contrary to reason to apply any kind of preparation to the inside of a cellar wall and expect the house to be dry. The moisture will still be in the walls and if the damp-proofing preparation is able to keep it from coming through vertically it will travel horizontally, rising directly into the first floor, so that the last state of the house will be worse than the first.

The preparation should be applied on the footings as soon as they have been completed and the walls built on top of it; this prevents moisture rising by capillary attraction. After the walls are built and have become dry the preparation should be applied on the outside surface and carried well above the grade level, special attention being paid to having a good bond between that which has been applied over the footings and on the walls. Then the space between the walls and excavation should be filled in with earth, care and precaution being taken not to injure the damp-proofing material. On the cellar floors the damp-proofing should be applied between two layers of concrete, the same care being taken to unite the floor damp course with that over the footings, as with that on the outside walls. It is, of course, important to see that the concrete immediately on top of the damp course of the floor does not puncture the latter; if there are holes in the waterproofing it is certain that moisture will find its way through. Therefore, a safety coat of cement mortar should always be used on top of the damp course, and the concrete upon which the waterproofing is placed should be tamped down as smooth as possible.

If the damp-proofing be carried out in the above manner, it will be seen that the basement has been converted into a waterproof pan, and an absolutely dry cellar will be obtained. This scheme will be found of great practical value for builders and house owners generally, especially in the suburban and rural districts, where houses are often so located as to have damp cellars.

* * *

One Way to Wax Cement Floors

In reply to a question as to a method of waxing a cement floor so that it can be danced on, the Painters' Magazine says that cement floors are, as a rule, too porous to be waxed successfully without being first filled. Though rather expensive, shellac varnish is most convenient and best adapted for preparing the floors in the shortest possible time. Two thin coats of orange or brown gum shellac dissolved in denatured alcohol will give the proper foundation for the wax, which should be ordinary floor wax applied with a cloth or brush and polished with a weighted floor brush in the usual manner.

The Law Regulating the Practice of Architecture

III—Contract Between Owner and Architect

By ROBERT MORGENEIER, Architect and Engineer.

UNDER "owner" is understood a person, or persons, in whose name a building is to be planned, designed and constructed.

Under "architect" is understood a person competent to plan, design and cause to be erected a structurally and otherwise safe building, at a minimum cost, of maximum utility, and its visible parts of appearance satisfactory to its owner. Also that such architect is using his title under authority of the State.

The owner and architect are governed by the general law of contracts covering the specific performance of labor by one party in consideration of specific payment or payments for such labor by the other party. Such contract cannot bind or affect a third party unless such third party latterly comes under its provision by way of a supplimentary contract. The contract is not assignable.

Knowledge of Owner.—The owner's knowledge is assumed to consist in the belief that the architect is competent to contract and perform, but should it prove otherwise he cannot be held accountable. Further, as to the proposed building, an owner declares his intention to have a building planned and states where such building is to be located, its purpose and approximately its size or the number of its stories.

He may also be held to have and express some views as to the particular external appearance he may favor in the proposed structure, and of what materials in a general way it might be built. When an owner has declared his knowledge and intention as above to the architect a preliminary contract or understanding is entered upon by the parties, and if the proposed undertaking is of consequence it is the architect's duty to properly and clearly explain the conditions under which he will prepare preliminary plans, estimates, etc., and also inform the owner of the cost thereof. If the amount of fees involved exceeds $200 a written contract (accompanied by a first payment) should be entered upon.

Architects have a generally accepted schedule of charges, much as have physicians, attorneys, etc., but are in no way bound to adhere thereto and, in fact, no iron-clad schedule will hold good, the great variety of cases precluding it. Furthermore, the owner is assumed to know nothing specifically about the matter, although he is assumed to know that he must pay the architect for his time and labor, at the very least. To the end that no misunderstanding may arise, the architect should use the following preliminary contract form, for example:

John White, owner, to James Brown, architect—Please prepare preliminary sketch plans, first floor and front elevation on a scale of 1/8 inch per foot; also approximate estimate of costs for a six-story store and office building 40 by 96 feet, proposed to be erected on (here state location), for which plans, etc., I hereby agree to pay you $.......... Yours truly,
JOHN WHITE.

Accepted ...., 1909.
JAMES BROWN, Architect.

A printed form similar to above, with a heading setting forth the schedule of percentage charges, etc., would be advisable.

For large operations, requiring extensive preliminary study, surveys, searches and office draughting, the form should be approximately as follows:

This contract, made and entered into this——day of——, 1909, by and between —— as owner and —— as architect, witnesseth: That for and in consideration of —— dollars, in hand paid by said owner to said architect, and other valuable considerations to be hereinafter set forth, said architect agrees and hereby contracts to prepare the plans, specifications and cost estimates, make surveys, soundings, examinations, searches and otherwise perform and complete all the preliminary exhibits and date required for the exhibition of (here state kind, size, purpose, quality and location of proposed building, etc.). It being understood that said plans shall be on a scale of not less than ⅛ inch to the foot, of all floors and at least one elevation of each facade, all in pencil, and the cost estimate shall be based on quantities taken and labor applied to such quantities. It is further agreed that such preliminary plans, etc., shall be completed and delivered by the architect within —— days from the date hereof and that thereupon there shall become due him and payable the sum of $——. It is understood that the payments herein enumerated are for all the architect's charges up to and including the day upon which said preliminary plans, etc., shall be delivered.

Witnessed. Signed.

As the above contract is non-assignable and affects no third party, it may only be recorded to further perpetuate or conserve its text. Ordinarily it is preserved in a fireproof receptacle.

A great deal might be said on the conditions and phases of the preliminary stage, and cases without end cited in support of any position taken, but this would lead far beyond the boundary of a magazine article. At this point I would, however, direct the reader to the 2,000 or more cases indexed in Watis, where clear and unequivocal endorsement will be found for all that can be only hastily referred to here, or dogmatically maintained.

I am well aware that some readers will consider the making of any contract for preliminary work useless, unnecessary, an affront to an old friend or patron, "red tape," etc., but I say, rather any or all of these than practicing a sort of false pretense in the start and later on attempting to compel payment under threat of law.

And, assuming that your prospective client must pay you something for sketches, etc., is it within the spirit of the law to first ensnare him by silence or evasion, and then let him feel its weight?

If, however, the architect faces the unpleasant conditions of having his ordered preliminary plans rejected, his further services precluded and payment for services rendered refused, he then must either pocket his loss or enter his claim against the other party in an action at law. Thereupon arises the question, "What is a just and maintainable charge for such services?"

Referring to the A. I. A. schedule, we find that preliminary plans and study are fixed at 1 per cent of the approximate cost of the entire structure. Now it is evident that when the architect has achieved great eminence in his profession the charge, especially when he conscientiously delivers what is best and highest within him, elaborates it considerably, or has it elaborated by his associates or assistants, is, if anything, but a meager compensation. Yet, on the other hand, suppose the plans are of less eminent source and possibly of superficial or parsimonious execution? Are such two sets of equal value? Therefore, it has been repeatedly held that where the plans are full, complete, comprehensive and ample, the

maximum established charge shall be fixed as a compensation and if not, then their value shall be ascertained by expert testimony.

Contract Between Owner and Architect, Covering Plans, Specifications, Superintendency, Etc.

Knowledge of Owner.—After repeated consultations, changes, alterations and final satisfactory completion of sketch plans, a careful estimate of cost, settlement of every question of quality and particular use of building and particular materials of its construction, exact location, etc., arrived at, and all this having come to the knowledge and understanding of the owner, he is then in position to enter into a contract with his architect for full, general and detailed plans, specifications, superintendency, etc., of his proposed building. He also knows that the architect's charges will be, say 5 per cent of the cost of the completed structure.

Knowledge of the Architect.—Having, by a deliberative and collective mental process, based on past experience, study of the new proposition, reference to authorities, data, etc, and a searching inquiry into the right understanding on the part of the owner, satisfied himself that not only has he himself a firm grasp of the entire subject, but that the owner also understands it, or, in other words, that their minds meet, he is then prepared to enter a contract. The first step in that direction is the signing of the sketches by both parties. On each sketch shall be written as follows, viz.:

"Dated ——, 1909. Accepted.
"Signed. ————, Owner
"————, Architect."

The contract shall in every case be in writing and in triplicate, and may be in the following form, of which a printed form is recommended.

Contract between ——, owner, and ——, architect.

For and in consideration of a compensation of $——, whereof $—— has been in hand paid by said owner to said architect and receipt of which is hereby acknowledged, said architect agrees to furnish complete general and detailed plans and specifications for a (here state kind of building) practically as shown on the accepted preliminary plans thereof this day accepted as a basis by both parties hereto solicit bid for the construction of such building, direct and prepare contracts, superintend the construction thereof on lot (state exact location), and generally represent said owner up to and including the acceptance of such building by him. In consideration of which services said owner agrees to pay the compensation aforesaid in the following terms, viz.: One-fifth when signing accepted sketches, three-tenths when the drawings and specifications are completed and ready for bids. Thereafter the balance in three equal installments, each payable on the date of each certificate, respectively, due the contractor for work done and accepted.

————, Owner.
————, Architect.

Approved and accepted ——, 1909.

This contract should be recorded as well as all following contracts, the plans, specifications, bonds and, if the building is erected outside of the residential county of the architect (in California), his certificate to practice architecture shall be recorded in such outside county, in addition to the records of plans, etc.

It will be noticed that the owner is mentioned as the first party. This order may be reversed, but, in fact, the architect is the servant, agent and representative of the owner.

It is also seen that the contract creates one obligation for each party, viz.: The architect agrees to perform certain labor, and the owner agrees to pay for this labor. Thus all ex parte matter is eliminated, which, upon a test, will be found beneficial to both parties.

The American Institute of Architects has recommended additions, some of which are unnecessary, others objectionable, to-wit: If work on a building is postponed or abondoned the architect's fees are to be curtailed.

It would appear better to leave this out, as it is a weakening of the architect's position and unjust, as it stipulates that he shall suffer because of the breach of contract of the other party. If, through misfortune or great adversity, the owner cannot proceed it is his business to ask the architect for concessions. However, an owner may force this clause upon an architect: "The architect is to act as the agent of the owner," "and his duties and liabilities are those of agent only."

The only purpose of this clause might be to remind the architect of his duty toward the owner, but has no weight otherwise. Two lengthy clauses define some of the duties of superintendency. These properly belong under the heading "General Conditions" in the building specifications, and will there be fully set forth.

"Drawing and Specifications Are Instruments of Service and as Such Are to Remain the Property of the Architect."

Considering the delapidated and utterly useless condition of the material after the contractors are through with them, that parts are lost beyond recovery, that in most cases a full set of drawings and specifications must be recorded with the authorities and become public property, that perfect office copies should be on file and these include all tracings and, finally, that in the few instances in which the question has come up the decision has been adverse to the architects leads to the conclusion that its main value rests in designating the ownership of a sort of flotsam and jetsam on the architect's sea of trouble. In the June number we will examine into the relationship of the matter above discussed to the "General Conditions" ordinarily preceding the directive part of every building specification, and set forth as well as may be the positions of the respective parties therein mentioned.

* * *

In One Second

The following list of speeds has been carefully compiled by an authority who has devoted much time to the subject in order to insure accuracy:

In one second:

A man walking, 4 feet.
A fast runner, 23 feet.
A carrier pigeon, 87 feet.
A locomotive (traveling 40 miles an hour), 88 feet.
A swallow, 220 feet.
The surface of the globe on sea level at the equator, 1,500 feet.
The earth, 18 miles.
An electric current in copper wire armatures, 21,000 miles.
Light, 180,000 miles.
The discharge of a Leyden jar through copper wire one-sixteenth of an inch in diameter, 277,100 miles, which is said to have been the highest velocity measured.—Builder.

The instrument has not yet been devised to ascertain the speed of day-labor contracts on the Pacific Coast.

New Jersey Act to Regulate the Practice of Architecture*

SECTION 1. Be it enacted by the Senate and General Assembly of the State of New Jersey. Within sixty days after the passage of this Act the Governor of the State of New Jersey shall appoint five persons, at least four of whom shall be, at the time of this appointment, architects residing in the State of New Jersey, and who have been engaged in the practice of their profession for at least ten years; the said five persons shall constitute the New Jersey State Board of Architects, two of whom shall be appointed to hold office for one year and three of whom shall be appointed to hold office for two years.

Succession of Board

Section 2. Upon the expiration of the term of each member, the Governor shall appoint his successor for a term of two years, in like manner as the previous appointments; each member shall hold over after the expiration of his term until his successor shall have been duly appointed and qualified.

Vacancies; Compensation

Section 3. Any vacancy occurring in the membership of the State Board of Architects shall be filled for the balance of the unexpired term in like manner; the members of the board shall serve without compensation except as hereinafter provided.

Organization Oath

Section 4. The members of the New Jersey State Board of Architects shall, before entering upon the discharge of their duties, and within thirty days after their appointment, take and subscribe an oath before any officer authorized to administer oaths in the State, for the faithful performance of duty, and file same with the Secretary of State; they shall annually elect from their number a president and secretary, who shall also be treasurer, each of whom shall hold office for one year and until their successors shall have been duly elected and qualified, the secretary and treasurer shall receive such compensation for his services as may be determined by the board.

Rules, Records, Etc.

Section 5. The Board may adopt all necessary rules, regulations and by-laws to govern its proceedings, not inconsistent with the laws of this state or of the United States; the Board may adopt a seal, and the secretary shall have the care and custody thereof, and shall keep a record of all proceedings of the Board, which shall be open to public examination.

Quorum

Section 6. Three members of the Board shall constitute a quorum.

Special Meetings; Examinations

Section 7. Special meetings of the Board shall be called by the secretary upon the request of any two members by giving at least five days' written notice of the meeting to each member; the New Jersey State Board of Architects may adopt rules and regulations for the examination and registration of applicants desiring to practice architecture in accordance with the provisions of this Act, and may amend, modify and repeal such regulations from time to time.

Public Notice of Changes

Section 8. The Board shall, immediately upon the election of each officer thereof, and upon the adoption, repeal or modification of the rules and

*Printed by request. Much interest is being taken by Pacific Coast architects in the California law regulating the practice of architecture. The New Jersey act is pointed out as an improvement in many respects to the California law.

regulations for the registration of applicants, file with the Secretary of State and publish in at least one daily newspaper in the state the names and post office addresses of each officer, and copy of such rules and regulations, or the amendment, repeal or modification thereof.

Semi-Annual Examinations; Applicants

Section 9. Provision shall be made by the State Board of Architects for holding examinations at least twice a year of applicants for registration to practice architecture, if there shall be any such applicants; any person over twenty-one years of age, upon payment of a fee of five dollars to the Board, shall be entitled to enter any examination to determine the qualification for such registration.

Who May Be Licensed

Section 10. If the examination of any applicant for registration shall be satisfactory to the majority of the Board, and upon payment of an additional fee of fifteen dollars to the said Board, a certificate shall be issued to the applicant, authorizing him to practice the profession of architecture; any person who shall at the time of the passage of this Act be engaged in the practice of architecture in this state, and who shall present to the State Board an affidavit to that effect or a certificate from a similarly constituted Board of another state, and any person who is a member of the American Institute of Architects, shall be entitled to receive such certificate upon the payment to the said Board of a regular fee of five dollars; each person licensed shall cause such license to be recorded in the Secretary of State's office.

Revocation of License

Section 11. Any certificate granted by said Board or obtained by affidavit, as above provided, may be revoked by the said Board of Architects, for gross ignorance, incompetency, dishonest practice, or other good and sufficient reasons; but before any certificate shall be revoked, the holder shall be entitled to at least twenty days' notice of the charge against him, and of the time and place, within the county of his residence of the meeting of the Board, for the hearing and determination of such charge; for such purpose the Board shall have the powers of a court of record, sitting in the county in which its meeting shall be held, to issue subpoenas, and to compel the attendance and testimony of witness; witnesses shall be entitled to the same fee as a witness is allowed in the Circuit Courts of this state, to be paid in like manner; the accused shall be entitled to the subpoena of the Board for his witnesses, and a reasonable opportunity to produce his witnesses, and to be heard in person, or by counsel, in open public trial; the members of the Board shall have the power to administer oaths and conduct such examination of witnesses under oath; and no certificate shall be revoked, except upon the unanimous vote of all the members of the Board; and any such revocation of certificates shall be certified in writing by said State Board of Architects, under the hand of its president or its president for the time being, and attested by the secretary, with the official seal of the said Board affixed thereto, and such certificate shall be filed in the office of the Secretary of State, who shall be paid the usual fee for filing similar documents in his office.

Certified Copy of Evidence

Section 12. A copy of any certificate granted by the said Board, or any revocation of the same, as by this act provided, certified by the Secretary of State, where the original certificate or revocation thereof is required to be filed by the provisions of this act, to be true copy of the original filed in his office under the hand and seal of the said Secretary of State, shall be competent and plenary evidence to prove the facts contained in the said certificate, to the same extent as if the original document had been produced and proved in any court of civil or criminal jurisdiction whatsoever; any person whose certificate shall be refused or revoked by said State Board shall have the right of appeal by certiorari to the Supreme Court for a review of such action of said Board, and the State Board shall forthwith carry out the judgment of the Supreme Court on such review.

Penalty for Practicing Without a License

Section 13. If any person shall pursue the practice of architecture in this state, or shall engage in this state in the business of preparing plans, specifications and preliminary data for the erection or alteration of buildings, or shall advertise or put out any sign, card or drawing, designating himself as an architect, having an office and doing business within this state without a certificate thereof, in accordance with the provisions of this Act, he shall be guilty of a misdemeanor, and upon conviction shall be fined not less than fifty dollars and not more than five hundred dollars for each offense, or imprisonment in the county jail for a period of not less than one month.

Exceptions

Section 14. But nothing herein contained shall be construed to prohibit students or employes of licensed architects from acting upon the authority of such licensed architects, or to prohibit any person in this state from acting as designer of any building that is to be constructed by himself or his employes, or to prevent any person from employing another person to prepare plans and specifications for the erection of any building with the full knowledge upon the part of the owner that said person is not a regularly registered according to the provisions of this Act.

Expenses of Board

Section 15. The expenses of said Board, and of the officers thereof, and of the examinations held by said Board, and of any other matter in connection with the provisions of this Act, shall be paid from the registration fees above provided for, and not otherwise; and in no case shall any of the expenses be paid by the State of New Jersey or be a charge against the said State.

Annual Report

Section 16. An itemized account of all the receipts and expenditures of the said Board shall be kept by its secretary, and a detailed report thereof, each year ending with the 30th of September, duly verified by the affidavit of the said secretary, shall be filed with the Secretary of State within sixty days thereafter; the said Secretary of State to be paid such fees therefor as are now paid for filing similar papers in his office.

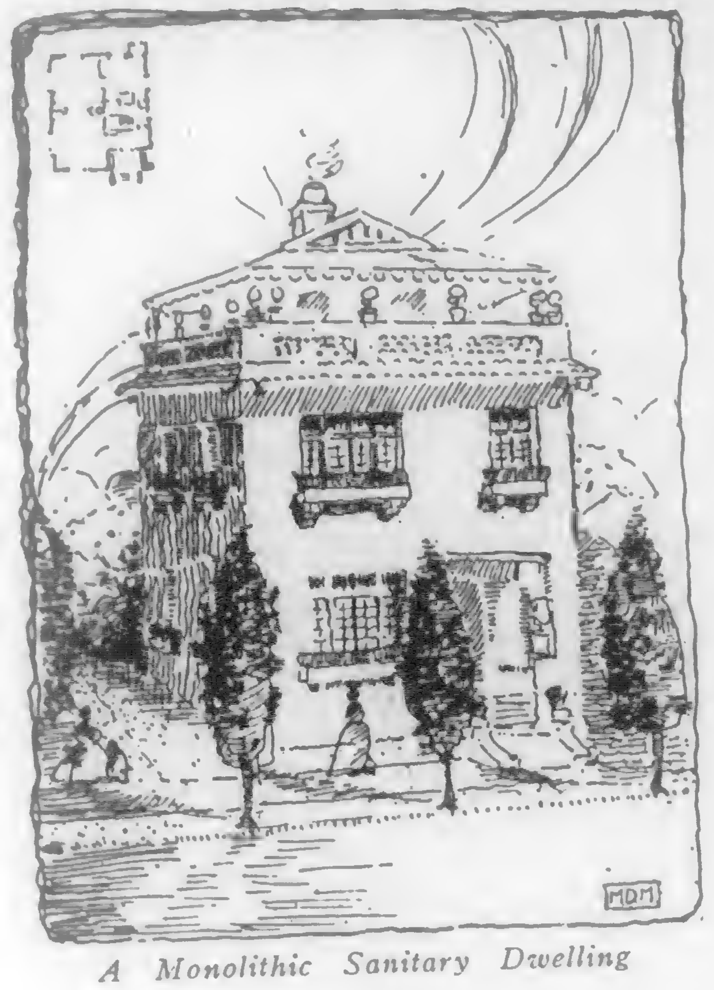
Expenses Met

Section 17. The members of the Board shall be entitled to reimbursement for their traveling and hotel expenses, incurred in pursuance of their duties, not to exceed five dollars per diem for each member of the said Board; the secretary and treasurer of the State Board of Architects shall receive such annual compensation as shall be provided by the Board, by resolution adopted by it at a regular meeting; no members of the Board shall be held personally responsible for any portion of the secretary's and treasurer's salary, should the fees for certificates received by said Board be insufficient to meet the same.

Disposition of Surplus

Section 18. Any surplus of fees remaining in the treasury after the payment of the expenses of the members of the Board, and the salary of the secretary and treasurer, as herein provided for, shall be paid annually to the Treasurer of the State of New Jersey and shall only be paid out upon the warrant and authority thereafter of the Comptroller of the State.

Unique Sanitary House



A Monolithic Sanitary Dwelling

AMONG the exhibits at the recent Tuberculosis Congress in Washington was a model of a sanitary concrete house which attracted much attention and was awarded the first gold medal.

The following are a few of the special and for the most part new features which the architect, Milton Dana Morrill of Washington, D. C., incorporated in the design.

The entire house is cast—the walls, floors and fixtures being of reinforced concrete; window frames are of cast iron. Duplication is, of course, the secret of the proposed economy, as it is estimated that when sand and gravel are easily obtainable, six-room attractive houses can be built for $1,200, when once the forms are perfected and made. These forms are being constructed of a standard unit type, so that they are to a degree interchangeable, and by this means houses may differ in plan and design and still be constructed over the same forms.

The possible omission of insurance and repairs and their general indestructible character makes this type of buildings especially applicable to rented houses.

To thoroughly clean a room the hose is used on walls, ceilings, and the composition floors are graded to plugged tile spouts, discharging on the lawn. All corners are coved, and all fixtures are bracketed from wall, which leaves no places for the shelter of dust, vermin or insects. The coal is hoisted by a simple chain block, attached to a swinging davit, and is dumped through a hole in the roof to a large pocket, from which it feeds by gravity into the firebox of the stove, the ashes falling into a pit and being removed from an outside door.

This stove combines in one compact fixture cooking range, house and hot-water heater and gas stove.

The garbage is placed in a cast-iron chamber in the smoke flue and after drying is dumped into firebox by damper.

Fireplaces in each room have flues about smokestack, forming a natural ventilation.

The icebox is arranged for use as a fresh air closet, doing away with use of ice except in hot weather. This is also arranged to be flushed with hose.

The walls are hollow to prevent dampness, and the roof is of open cellular construction, cool in summer. An attractive feature of the house is the roof garden and sunroom, forming out-of-door bedrooms, divided by use of movable screens.

Window boxes form an inexpensive and at the same time artistic decoration.

The exterior surface is of frank concrete, with pebbles washed and exposed.

The Charities Organization of New York is considering making a duplicate model to form a part of their permanent traveling exhibition.

The Architect and the Millman

SOME months ago there was published in The Architect and Engineer an article entitled "Architects Criticised by a Millman," being a reprint from the Mississippi Valley Lumberman. The article was read with considerable interest, and we have already published several interesting communications in reply thereto. From Boston comes some terse comments, William W. Lewis of that city writing to Carpentry and Building as follows:

"I have been much interested in the article entitled 'Architects Criticised by a Millman.' What the writer has to say is most interesting, and it seems probable that he has encountered some architects who, as the boys would say, were 'on' to their own business and that of some others. With regard to architects wanting something a little different to or from the regular sizes, and that their attitude adds 25 per cent or more to the cost for the consumer by insisting upon this class of work, I would say that 25 per cent may be added to the cost but probably 50 per cent to the value as regards the owner. In my own practice other than stock sizes of doors and sashes are specified to prevent, on the part of the contracting builder, easy substitution of inferior ready-made stuff for custom-made work called for by the specifications. I often go so far as to call for sash being delivered at the works unstained in order that sappy and otherwise inferior stock may not escape detection.

"The writer of the article says further: 'In filling Government contracts it does not do to deviate in the least from the plans as prepared by the Government officials.' If plans mean anything and the contractor agrees to do a specific thing or furnish a specific quality of work, why should he expect to be allowed to deviate from his contract? I suppose the contractor would expect to receive in payment for his contract dollars worth 100 cents each and not those worth 99.9 cents.

"Again the writer says: 'Some years ago I offered some suggestions which I thought very decidedly for the benefit of Uncle Sam and incidentally would help our firm filling the contract.' In practice it is to be feared that Uncle Sam would reap the incidental advantage, if any, and the firm the decided advantage, certainly.

"It is a pleasure to be confirmed in the belief that almost without exception the army officers are gentlemen and are faithful to their trusts.

"Where the writer says 'many a poor contractor has found to his sorrow,' etc., I would suggest that he substitute for the word 'poor' in this connection the word 'shyster.'

"Still another point which invites comment is the one where the writer says: 'The Government officials have a very arbitrary way of deducting allowance for minor deviations which seriously interfere with the profit account of the contractor.' If deviations are only 'minor' as regards the value and cost it would seem much fairer and on the whole the least expensive thing for the oppressed contractor to do if he fulfilled the contract both in the spirit and letter.

"At another point the writer says: 'There is no way of successfully appealing from their ruling,' which seems eminently fair and just, since no delinquent contractor may hope to escape punishment, and at the same time it tends to make bidding on public work popular with capable and straightforward contractors.

"I would say further that one object in employing a competent architect is to escape the nightmares and monstrosities usually embodied in the stock pattern molding, doors, sashes, stair posts, balusters, etc., as

they are misconceived in the minds of the millman. I would not have it inferred from what I have said that I regard all millmen and contractors as the natural enemies of a long-suffering public and my professional brethren; far from it. I find many mechanics who are capable and honest and who strive not only to fulfill a contract to the letter, but who take pride in making their work monuments to their ability and integrity. Such do not very often have reason to complain of their treatment by architects.

"The millman in question is presumably honest and efficient, so that he need not make personal application of any criticisms offered above."

Views of a San Francisco Architect

Editor The Architect and Engineer:—I was extremely interested in the very pertinent remarks of our good friend the "Millman" on our many imperfections. But he should remember that our proposition is far more complex and intricate than the manipulation of his "stock size" determining machinery, whilst the remuneration we are paid (for architectural work, not pseudo) is quite paltry in comparison to what the mill can earn. Again, all the while the public do not want, or cannot afford to pay, for the real article, the profession is bound to be peopled by a very large proportion of persons who know less of their art than the average well educated layman with a taste for architecture. Our friend is correct, we should be highly practical. The person who arranges an unsuitable plan is just as impractical as he who knows nothing of beauty —and a plan with all its utilitarian parts, even to the smallest minutiae, perfect as human ingenuity can contrive—without a suitable and beautiful mounting is not worthy of the name of architecture—Bah! What's the use?

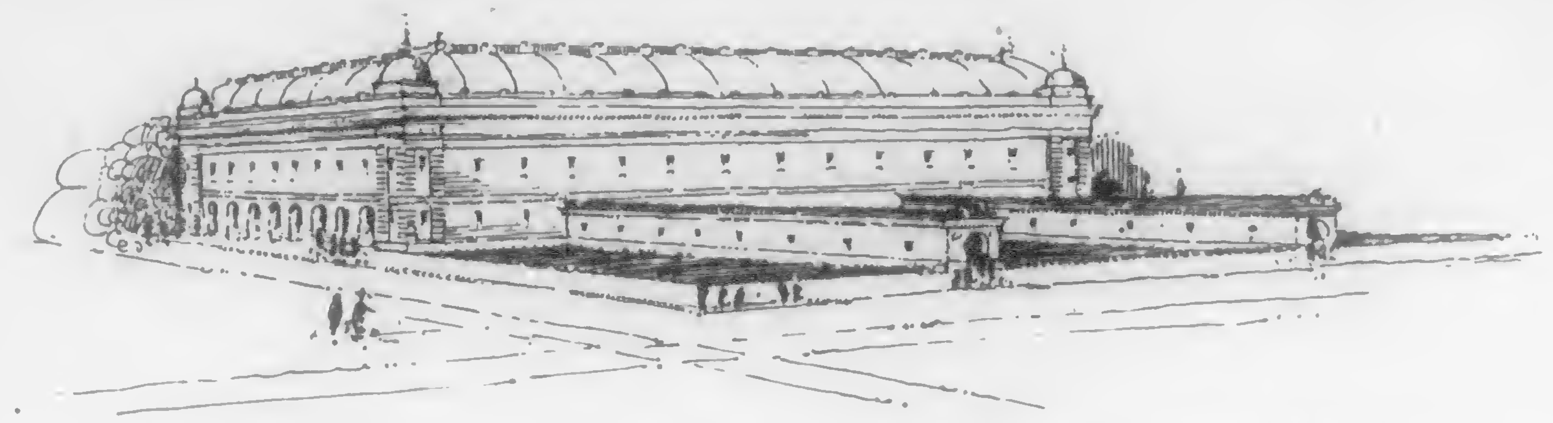
Yours very respectfully,

2208 Filbert St., San Francisco. GUILLAUME DES MOULLIN.

* * *

Quaint Effect in Den Decorating

IN A small, low-ceiled room, used as a den, a quaint effect has been obtained, says The Painters' Magazine, by the use of a dado, about four and a half feet high, made from a grotesquely figured Japanese matting, turned sideways and covered at the bottom by the wainscot cap, and at the top by a molding which forms the bottom member of the supporting band for a shelf, about six inches broad, that is carried on pairs of brackets at intervals, runs round the room and serves to support a collection of pottery and bric-a-brac gathered up in numerous trips out of the beaten pathways of travel. The upper wall is made of a plastic relief compound, a greenish gray tone, put on through a wire mesh, to give the effect of texture. This background has been divided into panels by flat oak moldings about two and a half inches wide. Long rectangular panels are surmounted by smaller square panels, with diagonal pieces, the direction reversing in the adjoining panels to give the effect of diagonal bracing. A broad chimney piece, built of light red mottled brick, rises to the height of the wainscot shelf. The casement windows are made up of a series of diamond-shaped panes, set in wood muntins. The white plastered ceiling is divided into square panels by similar moldings to those on the upper walls. The floor is of oak, stained dark and partially covered with a fluff rug, woven like a rag carpet from pieces of old Brussels and ingrain carpets. The furniture is solid and heavy—broad armed splint chairs with loose cushions and a box divan heaped with gay sofa pillows and a large mission table that serves also as a writing desk.



Proposed Auditorium Showing Arcade Entrances from Larkin Street, San Francisco
Oliver & Foulkes, Architects

Great Auditorium Planned for San Francisco

AN auditorium that would seat 14,350 people, and shelter, if occasion required, over 3,000 more, that would help attract the largest conventions and accommodate the largest opera audiences, and that could be used for balls, shows, industrial exhibits, and public gatherings of every kind, is projected for San Francisco, and the promoters hope to build it by a popular stock subscription without burdening the municipality with additional debt.

The site selected is the west, or Polk-street end of the old Mechanics' Institute block, which lies between Polk, Larkin, Hayes and Grove streets. Plans have been made for a structure to face on Polk street, with glass arcades running to ornamental portals on Larkin, so that the building would have entrances and exits on four sides. There would be a vast arena, 110x195 feet, surrounded by sixty-four boxes and a balcony, and there would be a promenade or roof garden balcony, thirty feet wide, running around the building, just below the roof, that would be accessible to automobiles by means of inclined planes.

Mr. Charles E. Naylor outlined the proposal at a recent meeting of the directors of the Merchants' Association. He said, in part:

"We have secured a contract for a 50-year lease on the Mechanics' Institute block and propose, if the public will back the plan, to erect on the west end the finest Auditorium in the country. The building can be put up for $400,000, approximately, the cost of the Kansas City Convention Hall. In that structure Sarah Bernhardt played to 6,500 people, and a performance of 'Faust' was witnessed by 8,000. The greatest gathering ever held in the old Mechanics' Pavilion was 8,400, during the Christian Endeavor convention. The proposed building would seat 14,350.

"Through the adoption of this plan, the public would have a chance to erect its own Auditorium by subscribing to the capital stock. The Kansas City Convention Hall cost $400,000 twice—it was burned down, and was rebuilt, for approximately the first cost, in three months' time. That enterprise has 8,000 stockholders, holding from ten shares to 16,000 shares of stock, at one dollar a share. It should be as much a source of local pride for the city to be provided with a great Auditorium by popular subscription as by a municipal bond issue.

"The plans, which have been practically decided upon, provide for a building 275 feet long by 220 feet wide and following generally the Kansas City Convention Hall model, but with some new and attractive features. All upper portions of the structure, including the balcony seats, will be reached by in-

clines instead of stairs, so arranged that the entire building can be emptied in five minutes without trouble or confusion.

"The following comparisions may be noted:

	Kansas City Convention Hall	San Francisco Auditorium
Length of building	314 feet	275 feet
Width of building	198 feet	220 feet
Open arena in center	17,750 square feet	21,000 square feet
Open arena seats	3,000	3,500
First balcony seats	5,480 Including boxes	5,850 Including boxes
Second balcony seats	2,500	5,000
Roof garden under cover	3,000 used as promenade, etc.	3,000
Total seating capacity	13,980	17,350
Roof garden area	15,000 square feet	18,200 square feet

"The 'Roof Garden,' as in Kansas City, is a flat surface some 20 feet wide, extending entirely around the building just under the roof, and will provide a popular and pleasant promenade. It will be available (as the one in Kansas City is) for displays during expositions, and will be reached by an incline that will accommodate equally automobiles and pedestrians. It is not intended to afford a practical seating space except for resting, or hearing without being able to see what is usually in progress on the floor below; but it will be an excellent location on occasions of promenade concerts and the like, where music can be heard to advantage. The actual seating capacity, therefore, each person seated being able to see and hear everything that takes place on a convention platform, will be 14,350, or 3,370 more than the same actual seating ability of the Kansas City ideal hall.

"It is also proposed to arrange the floor space so that fully one-half of the seats may be removed, and thereby double the open arena area for the accommodation of fairs, shows and exhibitions of all kinds. This arena will, at other times, be 110 feet by 195 feet in dimensions. For fairs it will be about 170 feet by 250 feet or larger.

"The last figures given are tentative, but will be closely approximated in the completed plans.

"As will be seen, the compact arrangement makes it possible for every person who is seated to hear distinctly what is going on.

"There is another feature which has been borrowed from our Kansas City pioneers in modern auditorium building, and that is in providing for large spectacular, dramatic and operatic productions that cannot be accommodated or advantageously staged or produced in an ordinary theater.

"This is done by providing a moveable and removable stage about 60 feet deep by 110 feet wide, which will be set up in the end of the open arena and moved forward into any position desired, and, together with drop side curtains, thereby reduce the size of the auditorium proper or seating capacity to an elastic number ranging from 10,000 down to 2,000.

"This plan has worked perfectly in the Kansas City Convention Hall, where the largest audience that ever attended a dramatic performance in the world, 6,500 persons, saw Sarah Bernhardt in 'Camille,' February 28, 1906, and were comfortably and satisfactorily accommodated, while 8,000 attended a grand opera rendition of 'Faust,' being the greatest audience that ever heard an opera in America; and in the same hall an audience of 12,000 persons attended a megaphone minstrel performance."

The Death of Newton J. Tharp, City Architect

NEWTON J. THARP, City Architect of San Francisco, died of pneumonia in New York city on May 12th. Mr. Tharp was sent East by the Board of Supervisors April 25th to gather data on the construction of hospitals, with the idea of embodying the most up-to-date features in his plans for the new City and County Hospital in San Francisco. It was while in search of this information that Mr. Tharp was stricken with the fatal malady that carried him off almost without warning. He is survived by a widow and son, Lawrence, who accompanied his father East. The remains were cremated in New York.

In the death of Architect Tharp San Francisco loses one of its most faithful servants—a man who made his personal comfort and health second to his duty toward his city. The position of City Architect was given him soon after the great fire of 1906, at a time when practically every municipal building was in ruins. It remained for him to plan the noble structures that since have risen in place of those destroyed. It was, indeed, a stupendous task—barely commenced, in fact, when he was taken away. With the same keen recognition of the ability of others characteristic of Julius Cæsar—and Newton Tharp was frequently likened to that great Roman leader for the strong facial resemblance—he gathered around him a staff of experts, none better in the country. He sought the best help the market offered, and he was willing to pay well for it. At the time of his death Mr. Tharp had a corps of more than sixty draughtsmen in his employ, each especially fitted for the particular line of work for which he was engaged. While an extremely busy man, Mr. Tharp invariably found time to listen to the advice and suggestions of outsiders, especially in regard to various building materials that promoters desired to have the office make use of. He avoided favoritism and if, in his opinion or in the judgment of his assistants, there was merit in an article, he did not hesitate to use it. The following incident is one of many which goes to show Mr. Tharp's liberal, yet shrewd, way of handling the trade:

A manufacturer of material called upon the City Architect and presented his card.

"I seem not to have heard of you before," said Tharp. "Where is your factory and what work have you done?"

The visitor proceeded to answer the questions, but had hardly begun when Tharp interrupted:

"I am very busy to-day. If you will step into the next room and talk to my engineer I will see what can be done for you."

Five minutes later, while the manufacturer was endeavoring to convince the engineer of the merits of his product Tharp appeared and addressed his engineer in the following words:

"This man is all right. His work is A1, and he has a lot of valuable information that should go into our specifications."

Where Tharp got his information the manufacturer doesn't know to this day.

Mr. Tharp was extremely modest—so much so that it was difficult to secure any of his work for publication. He was especially averse to giving out anything from his office that could be used for advertising purposes. An incident is recalled of a San Francisco representative of an Eastern house, whose goods had been specified by Tharp. The local representative had called repeatedly in an effort to secure pictures of the new Hall of Justice and one of the new schools. Each time he went away without the photos.

Driven almost to distraction, the agent who was endeavoring to satisfy the demands of his house, which wanted the pictures for a catalogue, determined to change his tactics somewhat in an endeavor to extract from the architect the much-wanted drawings.

"Say, Mr. Tharp," he said one day after reaching the architect's private office, "I want to hire a couple of your draughtsmen for a day or two. Can you spare them?"

"What for?" asked Tharp in a surprised tone.

"To make me a good drawing of the new Hall of Justice," replied the agent.

Tharp commended his caller for his clever way of renewing an old request, but the fellow went away without the photos.

Newton J. Tharp was born in Petaluma forty-two years ago, and was one of eight children. He spent his early years in that town, and was a close friend of Luther Burbank, the renowned scientist. During his youth he went to Chicago, where he took up the study of architecture and painting. Later he went to Paris, where he attended the Institute of Beaux Arts. Having traveled in Europe for two years he returned to the United States, and practiced his profession as an architect in New York and Chicago, but decided to settle in San Francisco in 1889. Tharp was married to Miss Laura Hanna in Los Angeles in June, 1892.

The deceased architect was first employed by the late Edward R. Swain in San Francisco, and on the death of the latter, who had been representing Page Brown, the architect of the ferry building, Mr. Tharp carried out the work undertaken by Mr. Swain. He became the senior member of the firm of Tharp & Holmes and designed the Dewey monument in Union square, as well as the Grant building, the Sloane building, the Whittier residence, the beautiful Martin home in Ross Valley and other well known structures. Just before the fire in 1906 Mr. Tharp was associated with Architect Albert Farr. Mr. Tharp became City Architect in October, 1907, and planned all of the new municipal structures now under course of erection.

Tharp was one of the most beloved members of the Bohemian Club, of which he was a prominent member. He acted as sire of the midsummer jinks of 1904, when the "Quest of the Gorgon" was the theme. He was also a member of the American Institute of Architects and a director of the San Francisco Art Institute.

Charges Against the San Francisco Board of Public Works

Claim that Clinton Wire Fabric was Substituted for Cold Twisted Square Bars in Reinforcement of County Infirmary.

What the City Architect, Newton J. Tharp, specified: *Cold twisted square bars having an elastic limit of 65,000 pounds to the square inch.*

What the Condon-McGlynn Co. substituted in place of Mr. Tharp's specifications: *Electrically welded wire fabric having an elastic limit of only 42,000 pounds to the square inch, or 65 per cent of that required in the original specifications.*

Difference in cost: *Condon-McGlynn (or Clinton wire fabric), 32 to 42 per cent less than twisted square bars.*

Saving to city—*None.*

Saving to contractors—*Difference between cost of the two reinforcing materials.*

Question—*Why was the substitution made and by whose orders? The correspondence of the late City Architect indicates only too clearly his strenuous objection to any change being made in the original specifications. Yet, in spite of this opposition, the substitution was effected apparently by some one in authority.*

President Day at the first day's hearing offered as evidence for the defense a letter claimed to have been written by the late City Architect to the Board of Public Works consenting finally to the changes that were made in the specifications. The attorney for the Good Government League, which is prosecuting the charges, questioned the genuineness of the letter, and Day offered to submit the document for expert examination.

A SUCCESSFUL attempt to force upon the city and county of San Francisco a different kind of concrete reinforcing material than that specified by the City Architect has come to light through the filing of charges against the Board of Public Works by the Good Government League. Correspondence between the late City Architect, Newton J. Tharp, and the Condon-McGlynn Company has been made public and it shows that in spite of the City Architect's repeated objections, influence was brought to bear by some one which resulted in the use of the Clinton electrically welded wire fabric on the new county infirmary in place of cold, twisted, square bars, specified by the City Architect. The contractors, Condon-McGlynn Company, are said to have taken the job for about $15,000 less than any other company figured. In order to come out somewhere near even, the contractors are said to have used every means within reason to keep down the cost. The substitution of a cheaper reinforcing material was, on its face, one of the most apparent violations of the original specifications. How the City Architect fought against this substitution without avail is best told in that gentleman's own letters to the contractors and Public Works Board.

On January 22, 1909, the City Architect received the following letter:

Newton J. Tharp, City Architect. Dear Sir:— Enclosed please find design for concrete roof slab with "Clinton Fabric" reinforcement, as the equal of "Trussed Metal," for the Hospital for the Infirm Poor, as per specification. Please inform us if this meets with your approval.

Very respectfully,

CONDON-McGLYNN COMPANY,

By D. E. CONDON.

Mr. Tharp replied on February 2nd as follows:

Messrs. Condon-McGlynn Co., 789 Mission Street, City. Gentlemen:—Replying to yours of January 22, 1909, containing the request regarding the substitution of "Clinton Fabric" reinforcement for the floor slabs for the Hospital for the Infirm Poor, in place of the "Trussed Metal" specified, I wish to state that I have had the matter gone into thoroughly by the Engineering Division of this department, as well as by Mr. Jubb who originally designed it, and we are all of the opinion that the substitution proposed is not desirable on account of the difficulty of properly laying concrete on a surface of considerable pitch. We are also of the further opinion that it would not only be better for the building, accomplishing in every way what we desire for the roof slabs, but it will be cheaper to yourselves to execute.

Yours truly,

NEWTON J. THARP, City Engineer.

It is apparent from the correspondence on file at the office of the Board of Public Works that the contractors paid little heed to Mr. Tharp's orders, for under date of April 3rd, the City Architect again wrote the Condon-McGlynn Company as follows:

Gentlemen—My superintendent on the Home for the Aged and Infirm on the Alms House tract reports that up to the present date your firm has made no attempt at getting reinforcing material or fabric on the grounds for use in the second and third stories of the building, in accordance with my letter of instruction to you on date of March 10, 1909. It will be absolutely essential that this material be on the grounds before you will be allowed to start the pouring of concrete in the forms already in place, otherwise the condition is liable to arise where you will have to stop work at a point that will be of great injury to the proper construction of the building.

The City Architect concludes the above letter by a peremptory request that the contractors take immediate steps toward getting the proper kind and amount of material for reinforcements on the grounds at once.

This letter of Mr. Tharp brought the following response from the Condon-McGlynn Company, under date of April 5th, admitting they had had for some time the reinforcing material on the ground, but, of course, not the kind originally specified and insisted upon by Mr. Tharp. The letter follows:

We are just in receipt of your communication of April 3d, stating that your superintendent on the Hospital for the Infirm Poor informs you that we have made no attempt at getting reinforcing material or fabric on the ground for the second and third stories. We beg to inform you, however, that for some months past all steel and fabric for the reinforcements for this building have been on the site, and we are at a loss to understand what is meant by your letter to the contrary.

We started pouring concrete this morning and will continue to do so, feeling that in some manner you have been misinformed, but if it is your intention to stop the work, and during such fine weather, we will instruct our superintendent to do so for the present upon the receipt from you of a written order to that effect.

On April 9th, the following report was sent to the Board of Public Works from the City Architect's office:

It is my unqualified opinion that the city would be better served in every way if the Board of Public Works should see fit to take advantage of the fact that the time for completion of the contract, held by the Condon-McGlynn Company, for the construction of the reinforced concrete portions of the infirmary on the Alms House tract has lapsed and declare the contract null and void, in accordance with the terms of the resolution drawn up by the City Attorney and introduced on last Wednesday's meeting.

At no time since the signing of the contract have the contractors shown that they possessed the means, ability or intention to properly carry on a work of this magnitude. It has been one long fight on my part to keep them anywhere near the proper mark set at any time since the work commenced.

The work has been delayed beyond all reason, and to such an extent that other contractors are beginning to complain, and justly so, of the expense that they are being put to by the slow progress being made on the main contract.

No matter how they may try to confuse the real issue, there is but one matter that has brought about the present crisis.

They were notified on the 10th of March, in writing, that they would not be allowed to use the same reinforcement for the floor slabs of the second and third floors as that which they had used in the first floors as a substitute for that called for in the specifications.

The reason being that said substitute had never been presented to me for approval, and upon analysis was found to be equal to only about one-half of the value of that called for in the specifications.

Although given ample notice regarding the matter of reinforcement of the floor slabs, they made no attempt to get the proper materials upon the ground and commenced to pour the walls and columns of the first floor of the male ward contrary to my orders, their intention plainly being to run the walls, columns and beams to a point where a cessation would cause irreparable injury to the building, and put me in a position where I would be forced to allow them to use the same inadequate reinforcements because of there being nothing else at hand.

The matter of a test of the first floor slabs is a matter of concern to me and the Board of Public Works only, and should not be allowed to be introduced to confuse the real issue.

In case the Board of Public Works should consider the best policy to be to allow them to continue and finish the building, I would suggest that they be made to feel in the most unmistakable manner the gravity of the situation they are in, and that they be allowed to continue only on the following basis:

First—That all concrete poured since receiving the orders from my inspector not to do so on last Monday morning at 8 o'clock be torn out at once.

Second—That the proper reinforcing materials for the second floor slabs, in strict accordance with the plans and specifications, be taken to the site at once and made ready for use.

Third—That they keep an adequate force of men, satisfactory to the City Architect, on the work at all times.

Fourth—That they be allowed to make no tests or do anything else liable to cause injury to completed portions of the building except under the direction of the City Architect, and that all materials carted on to a certain portion of the first floor, contrary to my directions, be removed at once, and any damage appearing be made good.

Fifth—That they be inculcated with the doctrine and made to understand beyond a doubt that the inspector on the job is one of the arms of the Board of Public Works and that they will be held strictly accountable at all times to his orders. At present they seem to be imbued with the idea that he is more or less of a joke, and to be taken seriously or not as suits their convenience. Respectfully submitted,

N. J. THARP, City Architect.

THE ORIGINAL SPECIFICATIONS.

The following is a copy of the City Architect's original specifications:

REINFORCING STEEL:

All sizes shown on plans, unless otherwise designated, are for a square section.

All steel is to be in accordance with the Manufacturers' Standard Specifications for "Soft Steel." All rods, except stirrups, column hoops and ties are to be "cold twisted" and shall conform to the following requirements after twisting:

Elastic limit for ½" squares and smaller, not less than 65,000 pounds per square inch.

For ⅝" to 1" squares, not less than 60,000 pounds per square inch.

Rods to be twisted one complete turn in seven (7) to eight (8) times the size of the square, and shall bend cold around a pin of twice their diameter without fracture on the outside of the bent portion.

All rods to be clean, free from seams, flaws or cracks and shall not vary in cross-section or rolled weight more than two and one-half (2½%) per cent above or below the theoretical.

A round section may be used in place of the ⅛" x ¾" flat shown for stirrups and column hoops, provided the same amount of material is used properly distributed.

High carbon deformed rods may be used in place of twisted rods, provided, however, that if the guaranteed elastic limit of the bar to be used is less than that specified for twisted steel, the sectional area of steel required is to be increased proportionately. Rods must be of uniform quality and strength, and shall bend cold around a pin of equal diameter to an angle of 100 degrees without fracture on the outside of the bent portion.

The floor slabs may be reinforced with "*Electric Welded or other drawn fabric*" in long lengths or rods in place of the twisted rods shown, provided equal strength is obtained. The sheets are to lap one mesh on the edges and to extend into the end walls or beams 12" for anchorage. In all window sills, belt courses, cornices and recoils of small dimensions and projections which are likely to be broken off in the removal of the forms, a galvanized wire netting two (2") inches diamond mesh of No. 18 wire is to be used, pressed into the forms and allowed to project into the mass concrete; the netting is to be tacked lightly to hold it near the face of the work and prevent it becoming displaced while depositing the concrete.

All wiring to hold the reinforcing in place is to be done with No. 12 gauge annealed wire.

THE SUBSTITUTE SPECIFICATIONS.

At the request of the Western Expanded Metal Company, Engineer Jno. B. Leonard presented the following report bearing on the original and the substitute specifications:

In regard to the reinforcing of the floors of the County Infirmary, N. J. Tharp, Architect:

By referring to the "Addenda to Specifications for Infirmary Building, city and county of San Francisco," as forwarded to me by you, you will note the second paragraph that these specifications call for steel "to be in accordance with the Manufacturers' Standard Specifications for Soft Steel." In the following paragraph these specifications call for an elastic limit for one-half inch squares and smaller of not less than 65,000 pounds per square inch. These two conditions are incompatible, although to just what degree cannot be definitely determined, owing to the influence on the metal by cold twisting.

These specifications further permit the use of high carbon deformed bars, subject to the condition that if their elastic limit is less than that above specified, sufficient additional material must be added to secure the same elastic strength. For instance, if a steel of 50,000 elastic limit were to be used, the sectional area would have to be increased, otherwise the strength obtained would be but 77% of that required; and this deficiency in strength would then have to be made up by adding additional metal.

The privilege is, also, granted in these specifications to use electric welded or other drawn wire fabric in long lengths or rods in place of the twisted rods shown, provided EQUAL STRENGTH IS OBTAINED.

Your Mr. Wheeler reports to me that the plans call for ⅜" square rods spaced at 9" centers for the floor reinforcement. The rods would provide a reinforcement of about .186 square inches per foot of width of slab. The reinforcement that is being used consists of three strands of No. 6 wire per foot of width, which gives a reinforcement of .087 square inches per foot of width, which is about 48% of what is required.

Samples of the reinforcing wire fabric that is being used on the building have been submitted to the Pacific Laboratories to determine its elastic limit and ultimate strength per square inch. They report to me to-day that they find the elastic limit to be about 42,000 pounds per square inch, and the ultimate strength ranging from 61,000 pounds per square inch. You will note that this elastic limit strength is about 65% of that required in the specifications issued by the City Architect.

By investigation of the above figures you will observe that the reinforcing material that is being used in this building is only about 31% of the efficiency required for this material in the specifications. You should bear in mind that this 31% is dependent upon the elastic limit, which may vary; this variation may tend to increase or decrease the 42,000 pounds found on the sample tested. If it increases, of course, then the 31% must increase, and vice versa, if it decreases the 31% will decrease.

If a wire fabric, consisting of No. 6 wire, were to be used in strict accordance with the specifications these strands would have to be placed about one and one-quarter inches from center to center.

Sincerely yours,

JOHN B. LEONARD.

MORE EXPERT TESTIMONY.

Mr. John B. Leonard, Consulting Engineer, Sheldon building, San Francisco. Dear Sir—Referring to your letter of February 5, 1909, to the Western Expanded Metal Company, regarding the substitution of electrically welded wire fabric having an elastic limit of 42,000 pounds per square inch, for cold twisted square bars having an elastic limit of 65,000 pounds per square inch, in the County Infirmary, we have to say that such a substitution is entirely improper and can only result in a very much weaker slab. We are not familiar with the plans in question, but unhesitatingly state, as a matter of general principle, that in substituting electrically welded fabric for cold twisted square bars the aggregate area of wires substituted, to give an equally strong slab, should in all cases have an area at least equal to the square bars which they replace.

We understand that perfect continuity was specified in the original design, which relieves the question from any complication on that score, so that the problem resolves itself into the simple substitution of one material for a material no less strong in the same location in the slab. Under these conditions it must be apparent even to the uninitiated that a reduction in the area of steel can result only in the weakening of the slab. Very respectfully,

BAKER, LITTLE & HALL.
By (John G. Little.)

Cost of Reinforced Concrete Buildings*

By EMILE G. PERROT, M. AM. SOC. C. E., Philadelphia.

THE use of plain concrete for footings, foundations and as a substitute for massive masonry wall construction, has come to be generally accepted by the building world of to-day. Even the most skeptical as to its use for columns and beams do not hesitate to use concrete in the above manner. As the constitutional infirmities of plain concrete became more evident and its use consequently restricted, means for overcoming these weaknesses by reinforcing the material with iron or steel rods at once opened up the field of application of concrete, so that to-day entire structures from footing to top of cornice or parapet are constructed solely of this material.

Apart from the mere adaptability of a material for building purposes, owners when investing large sums of money in real estate, must take into consideration the economical aspect of the construction. Aside from the desire to conserve their property (that is, to build so as not to burn), the saving on the insurance premium is very often a controlling factor in the selection of a type of construction to use. Twenty-five years ago the idea of making buildings of the factory type fireproof was uncommon; almost any sort of structure was deemed fit to use for manufacturing purposes. As the ascendency of the United States in the manufacturing world became great and we commenced to lead in the manufacture of the world's products, architects and engineers at once saw a field for their labors that had heretofore been left to the caprice of untrained minds, it being the exception for an architect or engineer to be consulted in the designing of a strictly factory building. To-day, however, thanks to the persistence of the insurance companies on higher standards, the design of almost all manufacturing buildings is attended with much study and they are usually built under the supervision of a competent architect or engineer. This change in methods has led to a much higher standard of building, and with the advent of reinforced concrete has come the commencement of a period when fireproof factory buildings are to be the rule instead of the exception.

We all know how the so-called "slow-burning" type of mill construction supplanted the joist constructed building a few years back; how the building laws of large cities classifies the buildings into first, second, third class, etc., according to their degree of fireproofness; how insurance companies are lowering the premium on fireproof buildings; in fact, the tendency to-day is toward a better grade of buildings. And it is right that it should be so, since what a farce would be our boasted twentieth century civilization should we still be content with the undesirable fire-traps erected by our forefathers.

We hear to-day a great deal concerning the scarcity of lumber; perhaps it is a good thing that lumber is becoming more expensive and the price almost prohibitive, for then we turn our thoughts to a substitute, and in doing so improve upon the methods that have been in vogue. The optimist's reply to the lumber question is, use reinforced concrete or concrete lumber, build so as not to burn, make your work permanent; reduce the cost of maintenance on your building, get lower insurance rates, or, better still, eliminate insurance. What is the need of insurance when the amount of inflammable material is reduced to a minimum? The cost of a building is very little more, and the interest on the additional investment is usually less than the insurance premium.

*Paper read before the National Association of Cement Users.

That the science of reinforced concrete has arrived at that state where we can with a certainty declare its adaptability for fireproof building construction, is a question beyond a doubt, as instanced by the many hundred reinforced concrete buildings erected and in use in this country, as well as by the result of actual fires that have taken place in such buildings. The writer has had to do with one such building where a fire completely destroyed the japanning kilns in the upper floor of a building without in any way affecting the concrete construction.

As to the increased cost of reinforced concrete over slow burning mill construction, everything else being equal, it varies from 10 to 30 per cent, according to the heaviness of the construction and the size of the building, also the number of times the forms can be reused.

Some buildings have been erected in which the floor loads were such as to preclude the use of heavy yellow pine timbers, as the sizes required would have been larger than it is practicable to obtain. On the other hand, the use of steel beam girders fireproofed would have added to the cost sufficiently to make the composite construction equal the cost of a pure reinforced concrete building.

In addition to the saving on insurance by having a fireproof reinforced concrete building, there must be taken into consideration the effect of wear and tear on the building if of the ordinary type; this is especially true where vibrating machinery is used, such as an instance of a leather factory, where the glazing machines are situated on the third floor. These machines were formerly in an upper story of a brick and joist constructed building, and produced so much vibration as to cause alarm to the owners, as well as making necessary constant attention to the shafting and machinery in the way of adjustment, and consequently adding considerably to the running expense. In their new location the vibration is absent and the cost of up-keep on machinery and shafting is reduced so much as to amount to very little compared to the cost in the former building.

In comparing the cost of reinforced concrete construction with steel construction fireproofed, we find that concrete construction is cheaper than the steel construction fireproofed. Actual bids on the two types of construction for the same buildings obtained reveal some interesting facts.

For the Ketterlinus building in Philadelphia, which is an eight-story and basement building, reinforced concrete was decidedly cheaper by about 20 per cent, and made a much stiffer building to resist the shocks of the heavy lithographic presses in the fifth and sixth stories of the building. This building has heavy concrete wall piers on the street fronts, veneered with four inches of mottled brick secured with copper ties. There are heavy reinforced concrete brackets connecting columns with girders and beams, and the floor system consists of deep girders and beams spaced about 4 feet 6 inches center to center for beams, the slab being 4 inches thick. The column footings are reinforced concrete, but the interior columns for five stories are of structural steel fireproofed.

Another notable instance of the saving effected by the use of reinforced concrete is the Boyertown building, Philadelphia. The owners saved about $60,000 by the skillful use of reinforced concrete for the entire construction, representing a saving of about 30 per cent. It is ten stories and basement, built of a concrete cage having the front veneered with granite in the first story and brick and terra cotta in the upper stories. The side walls are adjacent to party lines having simple reinforced concrete columns spaced about every 8 feet 6 inches centers to carry the floors and roof. Those in the basement were set back from the party lines sufficiently far to build a continuous reinforced concrete footing within

the property lines of the building, thus compelling the use of heavy reinforced concrete cantilever girders at the first floor level to carry the wall columns above; the load on the end of the cantilevers is 385,000 pounds, and the leverage 29 inches. The rear wall of the building is carried on cantilevers at each floor, due to a recess in the first story of the building for a shipping department. These cantilevers are seven feet long, but while they are much longer than those carrying the side walls, they carry less load, since there are cantilevers at each floor on the rear, while on the sides they exist only at the first floor level and carry nine floors and a roof. These are the heaviest concrete cantilevers ever built in Philadelphia, as far as I know. The reinforcement used throughout is cold twisted steel rods, except the columns in the interior, and some of the front wall columns where structural steel cores are used.

A very marked saving was effected by the use of concrete over brick for the wall construction of the buildings of the Janesville Iron Works, erected at Hazelton, Pa. This plant consists of a machine shop, foundry, pattern and pattern storage buildings, power-house and office buildings. All walls of these buildings are concrete and are monolithic. Concrete was decided upon for use in the walls because it effected a considerable saving over brick walls. As the site of the plant was such as to require considerable grading, and there were large quantities of rocks or mountain stones on the premises, the problem of bringing the ground to grade was most economically met by making the walls of the buildings of concrete. By this arrangement the contractor performed the grading without additional cost to the owner, using the stones in the concrete walls, making their removal unnecessary, and at the same time saving the cost of transportation of other materials for the walls.

Where sanitary precautions and immunity from deterioration are the controlling factors, reinforced concrete offers one of the best forms of construction; this is exemplified in the new plant of the Crane Ice Cream Company of Philadelphia, in which reinforced concrete was decided upon after an extended test to determine the action of salt water used in their business on the concrete and steel. The preliminary test and the actual use of the building for the past three years has demonstrated the fitness of reinforced concrete for this type of building. The plant is considered ideal, and its cost of construction was below the average for reinforced concrete construction.

To sum up, the cost of reinforced concrete buildings can best be considered by classifying them under several headings:

First—Warehouses and manufactories. Cost, 8 to 11 cents per cubic foot.

Second—Stores and loft buildings. Cost, 11 to 17 cents per cubic foot.

Third—Miscellaneous, such as schools and hospitals. Cost, 15 to 20 cents per cubic foot.

These costs include the building complete, omitting power, heat, light, elevators and decorations or furnishings.

* * *

Nearly Bath Time

The following is a verbatim copy of a letter received by a local real estate agent from a tenant in the fourth ward, says the White Plains Daily Record:

"Dear Sir: I wat them seller steps figsd right of—my wife near fel down last nite and like to brake her nec—Please send a Blumber and figs our bath tub it soon be time now for us to use him agen."

More Anent Fireproof Roofs

EDITOR The Architect and Engineer: The writer has been reading Mr. Tiedemann's article in the April issue of The Architect and Engineer, entitled "Wanted—A Fireproof Roof." It must not be forgotten that nothing was "fireproof" during the great catastrophe of April, 1906—not even steel girders and disintegrated fireproofings of all kinds. But if Mr. Tiedemann, or anybody else, wants as nearly a fireproof roof as can be had, he has it in a good felt and gravel roof—where heavy felt has been used with lots of good compound between the plys, and good, clean gravel.

It may sound incredible, but it is a fact, nevertheless, that when the writer inspected the roofs of the St. Francis Hotel, the Shreve, Kohl and Grant buildings immediately after the fire, he found that a little patching and reflashing was all that would be necessary to put these roofs in first-class condition. In many cases the metal flashings had badly disintegrated, and the skylight curbs gone or badly damaged, but the felt was found to be in good condition. The skylight curbs of the Grant building were of wood and must have burned fiercely; also there were found the charred remains of many timbers on this roof. But, as stated above, the flashings were the only part of the roof injured. None of these buildings would have had to be reroofed had the roofs not been cut to pieces by misuse during the rehabilitation.

The writer had partly covered the California Casket Company's building when the fire occurred. On the roof at the time were many timbers intended for tank supports, and we had a large pile of wood for burning under our roofing kettles. All were consumed, of course, by the fire, making a huge bonfire, but no damage was done to the roof otherwise than to blacken the gravel. After the fire we completed this roof without any repairs to the part previously laid.

All of the buildings mentioned were covered by the writer before the fire, with the standard five or six-ply felt and gravel roof. A fifteen-pound felt had been used, well saturated and seasoned, each sheet or ply of felt being mopped the full width with roofing compound. About 200 pounds of compound had been used, per square. We had taken pains with flashings and other details necessary to make a good roof.

The writer has yet to see a good felt and gravel roof fail to do its part in retarding the progress or spread of fires. He has built bonfires on some of his roofs to satisfy some "Doubting Thomases," and the only harm done was to blacken a patch of the gravel. Of course, like everything else, if it is not done properly, with pains and good materials, a gravel roof is not going to make good—either by long life or fire-resisting qualities.

Very truly yours,
THE WATSON ROOF COMPANY.
W. J. Watson, President.

* * *

Wants to Complete Architect and Engineer Files

Architect and Engineer Company, San Francisco, Cal.: Gentlemen—The department of civil engineering of the University of California wishes to bind the volumes in its possession of The Architect and Engineer. We find that one number is missing, namely, Volume 6, No. 3, for October, 1906. Can you furnish us this number? Very truly yours,

C. DERLETH, JR.,
Professor of Civil Engineering.

[We will gladly give a year's subscription to the person supplying us with the number called for by Professor Derleth.—Ed.]

The Passing of the Lamp Lighter

By FELIX J. KOCH.



The Last of the Lamp Lighters

Passing from out our village life in the greater part of the United States to-day is the lamp-lighter. Hardly a town so poor to-day but has its electric light; where not, there is the device for lighting the gas lamps simultaneously. At most, a lad goes about, pulling a little chain, and raising the flame thereby.

At Chevoit, in southern Ohio, however, there is still a lamp-lighter of the good old sort. Mounted on his gig, the man has his seat between two long cases, containing receptacles for oil. As the horse criss-crosses the street, from lamp to lamp, he stops at each, takes out the empty canister, puts in a full one, then a stroke of the match, and he is off. Next day he is back to repeat the performance. There are not many left of these old-time lamp lighters. Time will come, doubtless, when tales of their work will smack of very ancient history.

* * *

Reinforced Concrete in Church Building

What is said to be the largest church of its kind in the West and which embodies a number of features of unusual interest is that of the Second Church of Christ Scientist, now being finished in Los Angeles. It covers an area 107 by 158 feet and embodies among others the following constructive features:

The floors, beams, columns and roofs are of reinforced concrete, the most important of the structural features being the four reinforced concrete wall trusses and the dome carried upon same, as the trusses have a span of sixty-eight feet each and carry a total dead load of 350 tons. The trusses have a depth of twenty feet at the supports and ten feet at the center, and are sixteen inches in width. The reinforcement is designed in accordance with a new system, and consists of a light steel truss made up of angles and flat iron bars, so constructed as to carry safely the dead load of the wooden forms and wet concrete during the course of construction. Additional reinforcement consists of 12 1½-in. square twisted bars in the lower and six 1½-inch twisted bars in the upper chord of the truss to take care of the stresses due to the loads imposed after the concrete has set. The columns supporting these four trusses are twenty-eight by forty-eight inches in section, and are reinforced with latticed columns four 3½ by 3½ by ⅜ inch angles, having 2½ by ¼ inch lacing bars, with top and bottom bracket angles for the connection of the steel trusses.

Uncle Sam Finally Builds With Concrete

UP TO the present time the United States Government has hesitated about using reinforced concrete in the construction of public buildings. The supervising architect, Mr. James Knox Taylor, has been quoted repeatedly as being opposed to an all-reinforced concrete structure for Federal purposes. Concrete has had his endorsement, however, when used for foundations, floors, etc., but the structural and architectural parts of the building Mr. Taylor has maintained a decided preference for steel, brick and stone.

But now comes Uncle Sam with the announcement that at San Juan, Porto Rico, one of the largest reinforced concrete public buildings in the world is about to be erected. It will be unique, not only for its size, but also for peculiarities of construction. James Knox Taylor made a trip to San Juan, and found that the Porto Ricans would be struck in a heap if they had massive doors to swing or much window glass. It was a shock to Mr. Taylor's helpers to dispense with doors and windows altogether, and so they compromised on a row of large windows around the second story. But they did not force doors upon the sensitive Porto Ricans. And when this big concrete postoffice building is completed the curious of San Juan may go right up to the grill work which takes the place of a door and look in to their heart's content. On the ground floor not even a window glass will trouble their vision.

This peculiarity of construction is made possible by the gentle climate of the island. There is never occasion to keep out the heat, and the wind does not blow so strongly as to seriously interfere with the work inside. Had the Government authorities undertaken to force heavy doors and mazes of window glass upon the Porto Ricans there is no telling what dire events might not have happened.

But the absence of doors helps toward the end of fire-proof construction, and it is certain that this building will be as nearly free from the fire hazard as a building can. The structure will be concrete, strongly reinforced. The greater part of the exterior will show the concrete without decoration. But the ornamental portions of the exterior will be decorated in terra cotta. The floors will be of concrete.

The selection of concrete for the construction of the San Juan building, it is believed, will open the way to further use of that material in Uncle Sam's building operations. Its use at San Juan was dictated not a little by its comparative cheapness. To use granite, marble or sandstone would have required heavy charges for transportation from this country, as would also the use of any heavy structural steel. Porto Rico is without these building materials. But Mr. Taylor found right at hand an almost unlimited amount of good aggregate for concrete, and it did not take him long to hit upon that as the best material. Through the use of concrete the Government will save more than $100,000 on this one building.

The San Juan structure will be about half the size of the United States Treasury building at Washington. Its length will be 228 feet and its height 140 feet. The total cost of the building is expected to approximate $400,000. For the construction a sufficient amount is not yet available, and the plans for the building will be held until Congress makes a further appropriation.

* * *

"Yes; I'm going abroad at once. I gotta go."
"Oh, you mustn't let the doctors scare you."
"I got this from a lawyer."—Washington Herald.



Majestic Theater Building, Los Angeles
Edelman & Barnett, Architects

A California Theater of Reinforced Concrete*

THE Majestic Theater Building, erected by the Hamburger Realty and Trust Company on Broadway, between Eighth and Ninth streets, Los Angeles, possesses some unique and unusual engineering features. It is an eight-story and basement office front with the upper three stories extending back and over the auditorium of the theater portion of the building. It is this last feature that makes the building unusual and which was productive of a bold piece of engineering work. The entire structure is built of reinforced concrete.

The following loads were used in designing: First floor a live load 150 pounds per square foot; second to eighth inclusive a live load of 75 pounds per square foot. The roof was designed with a live load of 30 pounds per square foot. The above loads were used in designing the floor system, but in bringing down the column and footing loads, 10 per cent reduction was made on successive stories, using a minimum of 50 per cent of the calculated live load. The trusses over the auditorium were designed under the calculated live-floor load given above with a 10 per cent reduction in successive floors.

The foundations of the building rest upon a very compact gravel and the footings were designed for a bearing power of 3½ tons. This was conservative considering the nature of the soil. All twisted steel in tension was stressed to 20,000 pounds per square inch with a maximum outside fiber stress of the concrete of 500 pounds per square inch. Concrete in direct compression was figured at 450 pounds per square inch. The ration of the moduli of elasticity was taken as 15 to 1. The above stresses are in accordance with the building laws of the city of Los Angeles.

*Illustrations by courtesy of The Southwest Contractor.

The exterior walls are filler walls of reinforced concrete, but wherever it was desired to eliminate column projections for architectural reasons, hollow tile filler walls were laid up on the inside.

Attention is directed to the construction of both the balcony and gallery, which is deserving of special mention. Although balconies have been constructed before of reinforced concrete, along similar lines, we know of none with the great projection of both the balcony and gallery in this building. The longest balcony cantilevers, to the best of our knowledge are in the Temple Auditorium, Los Angeles; they are twenty-five feet projection and the longest steel cantilevers of like construction in buildings is thirty feet projection. The longest cantilevers of the gallery and balcony of the Majestic structure are twenty-seven feet and thirty feet projection respectively, that is, both of them have the greatest projection of any known reinforced concrete cantilever, while that of the balcony has an equal projection with the longest known steel cantilevers of similar construction. These statements, of course, do not include bridge construction.

The balcony is supported by six of these reinforced concrete cantilevers, giving a free overhang of thirty feet. The two side cantilevers are brackets, eighteen feet long coming off of the truss columns on either side of the auditorium. The four great central cantilevers, two of which are forty-five feet long, and two fifty-one feet long, have a clear projection of twenty-nine and thirty feet respectively and are supported on independent columns which are located in the curtain wall between the main floor of the auditorium and the foyer. The cantilevers rest on these columns, extend back over the foyer and are anchored in the reinforced concrete wall six stories high at the rear of the auditorium.

These cantilevers vary in section from ten inches wide by twelve inches deep at the outer end to eighteen inches wide by seventy-eight inches deep at the maximum section over the column support and are reinforced with seven 1 3/8-inch square twisted steel bars on the tension side which extend through the anchor-arm into the rear wall. There are three one-inch square twisted bars on compression side. As the moment decreases and there is a corresponding excess of steel on the tension side, the bars are bent down and hooked under the compression steel.

This method of disposing of the tension steel assisted the stirrups in binding the two groups of steel together at the same time resisting so-called shearing stresses (tension on the 45-degree plane) directly in an admirable manner. That portion of the balcony between the cantilever is constructed similarly to the ordinary joist system. The risers are reinforced concrete joists, or beams, resting on the cantilevers and monolithic with them, while the slab is supported on the top of one riser and hung from the bottom of the next. This construction is very economical in reinforced concrete for, unlike other materials, these beams are cast to conform to the curve of the balcony seats, a feature that could not be carried out in structural steel except at a considerable increase in cost. The gallery is constructed in the same manner, but of three feet less projection, having an extreme overhang of twenty-seven feet. The column supports center on, and are continuous with those of the balcony beneath.

Both the balcony and gallery were designed to sustain a superimposed load of 125 pounds per square foot and have been tested to over double that load. In making these tests the cantilever arm, only, was loaded, no load being placed on the anchor arm; this was the worst possible condition and made the tests extremely severe ones. A superimposed load of 95,600 pounds, a little over 260 pounds per square foot, was placed on one panel in the balcony between two cantilevers and extending from



Test Load on Balcony, Majestic Theater Building, Los Angeles, 95,600-lbs. on 381 Square Feet



Underside of Gallery of Majestic Theater Building, Showing 26 feet of Central Cantilever

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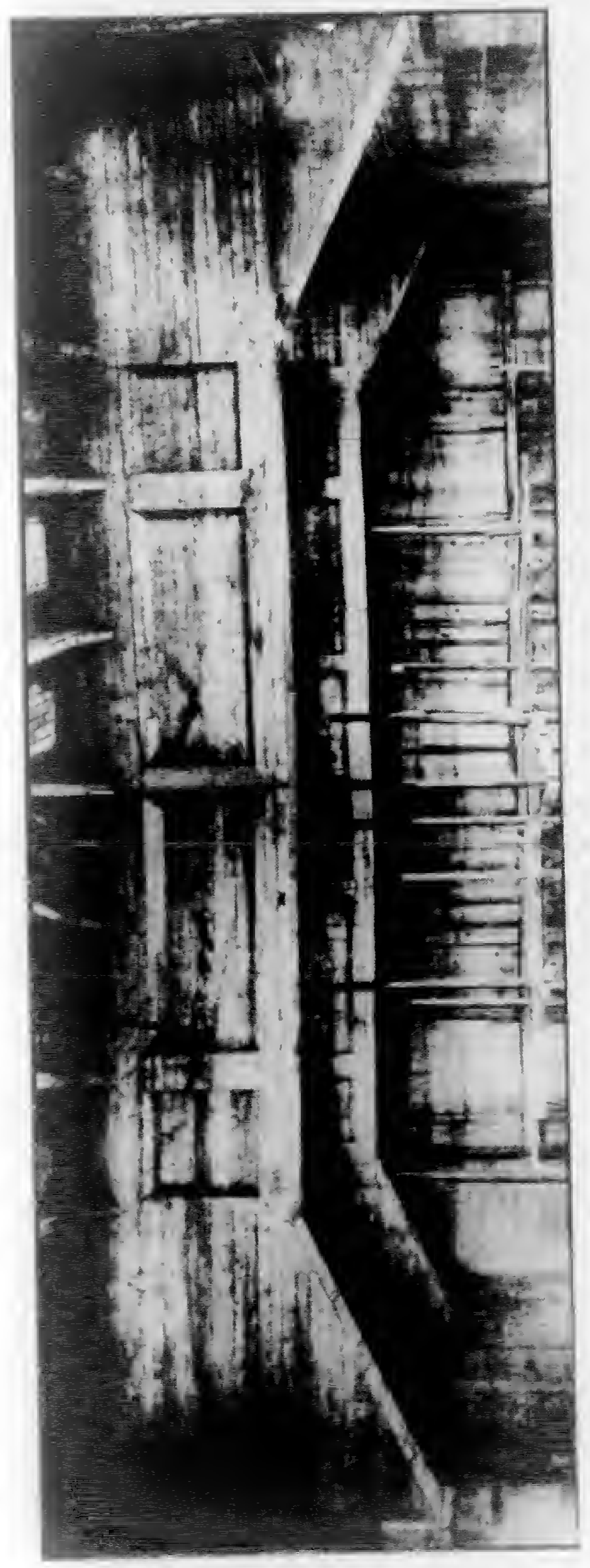
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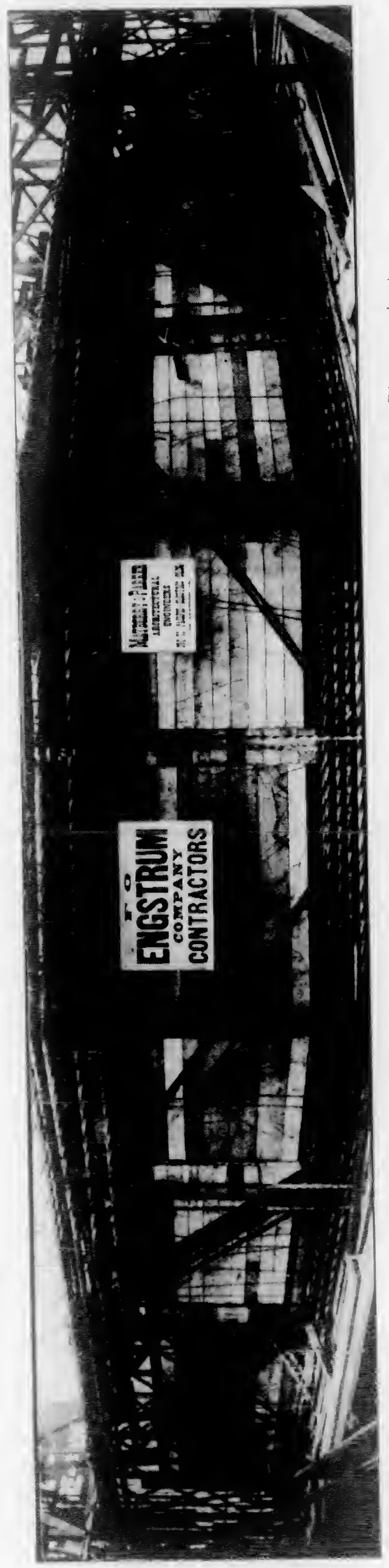
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Underside of Gallery of Majestic Theater Building, Showing 26 feet of Central Cantilever



Two of 71-ft. Trusses over Auditorium, Majestic Theater Building, Los Angeles.



Detail of Reinforcement for 71-ft. Truss, Majestic Theater Building. (Distortment due to Photography.)

the supporting columns to the front rail, an area of 361 square feet. This was a severe test on the floor construction, at the same time was more than equivalent to the load for which the cantilevers were designed, and as will be shown below was over 2½ times the maximum load they will ever be called upon to sustain. Under the above load the deflection at the end of the thirty feet cantilevers was only ¼ of an inch.

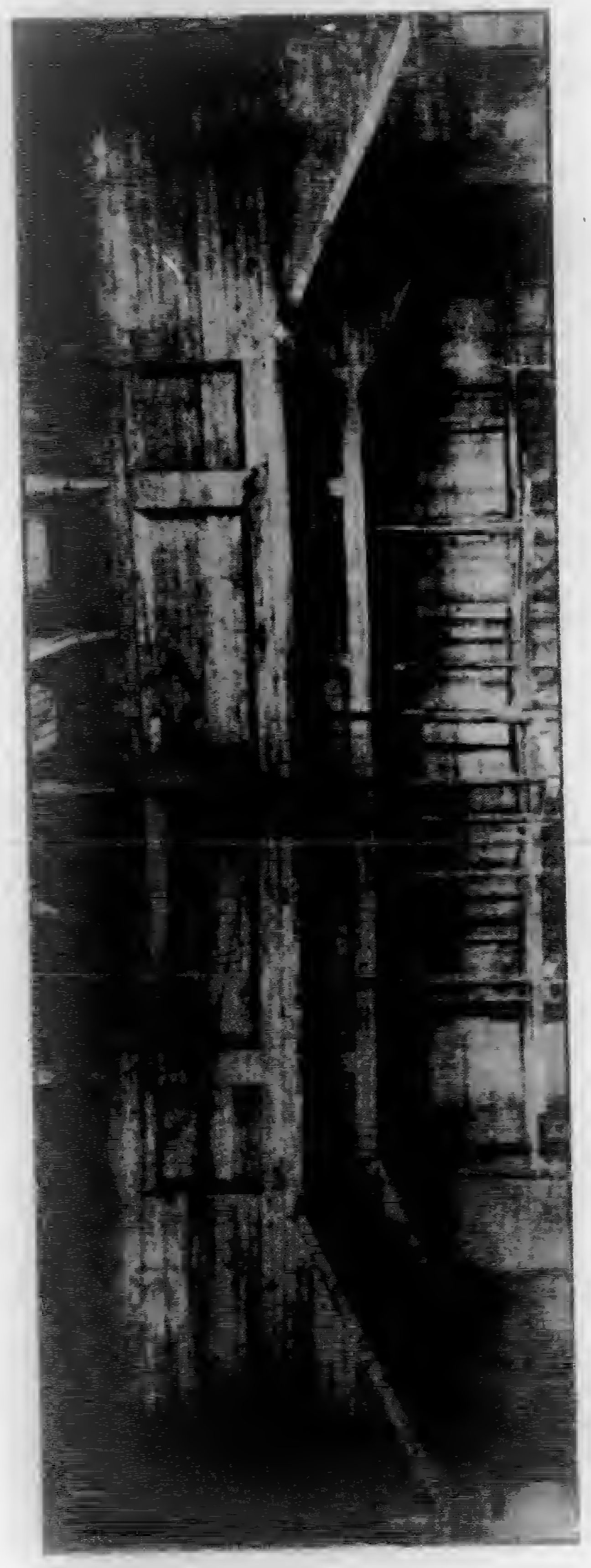
On the gallery a load of 87,400 pounds, a trifle more than 270 pounds per square foot, was placed directly over one cantilever, extending from center to center of adjoined panels, and as before from the column supports to the front rail of the gallery, an area of 311 square feet. The deflection at the end of the cantilever 26 feet long, was only 3/16 of an inch. Allowing 150 pounds for the average weight per person of an audience and 50 pounds for the weight of the opera chair and accessories, we have a total of 200 pounds. The space allowed to an opera chair is 3.75 square feet, exclusive of aisles. This gives a maximum possible load of 50 pounds per square foot with every chair filled and making no deductions for aisles.

On either side of the proscenium arch, which is also reinforced concrete, are the boxes in two tiers and no two boxes are on the same level, but are so arranged that the top of the rail of the farther box is on a level with the head of the occupants of the box nearer the stage. These boxes project from the wall six feet, and are carried by a six-inch cantilever slab. It is interesting to note that the complicated structure around the boxes, consisting not only of the boxes and rails at different levels, but also partition walls, several flights of stairs and the main walls of the building were all cast at the same time, truly monolithic structure.

The spanning of the auditorium with three great reinforced concrete trusses was a rather bold but successfully solved engineering problem. Two views of these trusses are given, one showing the arrangement of the steel reinforcement, the other the completed truss after casting the concrete. There are trusses of longer span than these, notably those in the Temple Auditorium, which are, however, more truly arched trusses and support only a roof.

The trusses in the Majestic Theater have horizontal chords and carry a three-story building on them. They are seventy-one feet long over all, ten feet deep, twenty-four inches wide at top, eighteen inches wide at the bottom and are calculated to support a live and dead load of over 750,000 pounds, or 375 tons, nearly nineteen carloads of twenty tons each. They are reinforced, in the top chord, with twelve 1¾-inch square twisted steel bars, while there are fifteen 1⅝-inch square twisted steel bars in the bottom chord.

The top bars are bent down and used as shear bars, near the supports, passing to and down the outside of the supporting columns, forming and giving a strong portal action. The lower bars are brought up as required in successive stages to the top of the truss to care for the reversed stresses that occur at the supports in reinforced concrete work. These bars were all hooked around bars at their ends. Owing to the great span it would be difficult to secure, as well as impractical to use continuous steel of such lengths, so it was necessary to use splices, and these were located at points of least stress, and of from five to six feet lap, with three clamps each—even then steel fifty and fifty-four feet long were required. In the corbels, where there would be maximum compression, owing to the reversal of stress as above, that the steel is arranged and laced in column form, following the line of the corbel. For the purpose of reducing the dead weight the central panels were reduced in thickness to twelve inches.



Two of 71-ft. Trusses over Auditorium, Majestic Theater Building, Los Angeles.



Detail of Reinforcement for 71-ft. Truss, Majestic Theater Building. (Distortment due to Photography.)

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These trusses could have been designed and built with open panels, but the cost of form work and difficulty of properly filling the separate members would more than offset the cost of extra concrete used. Moreover, the solid web assisted in caring for shearing stresses. The shoring was not removed until the expiration of six weeks. Before striking the centering a level was set on each truss in succession to observe any deflection that might occur. Despite the fact that there was a load of 500,000 pounds on each truss, the entire structure being completed, when the centerings was struck the cross wires of the instrument never left the mark. Afterward an additional load of 250,000 pounds was placed on one truss with a deflection of less than 1/64 of an inch.

Supporting these great trusses are massive columns over eighty feet long. The cross section at the bottom of the trusses is 36 by 60 inches, and there are sixteen 1½-inch square twisted steel bars on the outer or tension side and twelve 1½-inch square twisted steel bars on the inside. The steel varies from twelve to thirty-seven feet long and, with the exception of the shear bars which extend down to the balcony level, this column steel is carried down into the footings. The bars are arranged in lengths so that not more than one-quarter of the steel laps at the same section, and these laps are mostly four feet long, with three clamps to each lap. As shown in the photograph of the exterior of the building, these columns project two feet on the outside of the auditorium walls, as pilasters.

This was done to give an increased section for moment and at the same time not encroach on the theater space further. These pilasters, of course, extended into the six-foot alleyways required by city ordinance, and in order to preserve the same it was necessary to corbel in, beginning at a point about opposite mean balcony level and ending on the walls some six feet six inches above the court level. It was safely assumed that the moment, transferred to the columns from the trusses, would distribute itself into the eighteen-inch reinforced concrete enclosure walls between the columns that form the side of the auditorium, as well as that the moment by that time would be diminished so that the reduced column section (30 by 36 inches) would be sufficient to take care of the same, and this was true.

It was found in the design of these columns that in order to take care of the large negative moment in the trusses at the support it would take a column of great size and depth, and in order to keep the size of the column within practical limits an innovation was introduced. Instead of stopping the truss columns at the top of the trusses they were continued up to the level of the next floor, with a slightly reduced section, the latter being 36 by 48 inches, and reinforced with twelve 1¾-inch square twisted steel bars on the outside, now in compression, and with fourteen 1⅜-inch square twisted steel bars on the inside, now in tension.

In this manner the moment at the connection was distributed between the two sections and, so far as we know, is the only instance of its kind in this medium of construction. Transferring a portion of the moment at the support to the upper column section produced considerable thrust at the next floor level, and the amount of this thrust was assumed to be equivalent to that caused by the maximum moment the upper column section was capable of carrying. The transverse beams opposite the columns in this floor were, therefore, subject to direct compression, due to this thrust, as well as to flexure, due to floor loading, and they were designed and built as horizontal columns to resist both forces.

The stage is 38 by 80 feet and 64 feet high to the under side of the gridiron. The dressing rooms are on the left in three tiers above the stage floor and on both sides in the basement. The musicians' room, property rooms, lavatories, etc., are also in the basement under the stage floor. The fly gallery, eleven feet wide, is on the right, twenty-five feet above the stage, and supports one end of the paint bridge, the other end of the bridge resting on a gallery over the dressing rooms opposite, where also is located the artists' room. This paint bridge is about 55 feet long, built of light structural steel sections and is practically the only structural steel, outside the fire escapes and suspended ceilings, entering into the construction of the building. The gridiron beams, built of reinforced concrete, are suspended from the stage roof beams by looped steel bars, which pass under the steel of the former and over that of the latter.

The main stairs in the office front are enclosed on three sides by reinforced concrete walls, eight inches thick on one side, four inches thick on the other two sides. It was necessary to use winders at the return and this, of course, gives a stair slab with a warped undersurface. The top flight to the roof and pent house makes a full revolution of 360 degrees with a straight flight at each end. The three upper stories extend back over the auditorium, and are carried by three great trusses, and are used for office purposes.

Every seat in the main auditorium has individual ventilation. There is an opening in the slab directly under each chair and the space below the slab is a plenum chamber formed by a suspended ceiling. A damper and deflector control the quantity and direction of the air current so as to eliminate any tendency to draft. The foul air passes out through a grille in the center of the acoustic dome and then through a ventilation hood into a light well above. The stage and dressing rooms are thoroughly equipped with automatic sprinkler systems and forced ventilators.

A rather unique and uncommon method of handling concrete was employed on this building. In a convenient place a tower was erected up one side of which the hoist track was placed and on a platform, some thirty feet above the work on the building, was a hopper, with a capacity of two or three batches of concrete. This tower, track and hopper were elevated as the work progressed story by story. From the hopper controlled by a gate the concrete was run into a seven-inch galvanized iron pipe of movable sections and one or more ball-bearing joints, and delivered on the work where desired. Some difficulty was experienced at first by having either too small or too large a pipe, but it was found that a seven-inch pipe was about right, and by running a little water in the pipe before starting and afterward to clean it out, little or no trouble was had.

This gravity system was very satisfactory, both to the contractor by reducing the labor force, and to the engineers in charge by doing away with the running over the form work and newly deposited concrete by a large force of laborers. It also gave a concrete of very uniform consistency in, that if too dry it would choke up the pipe and if too wet the aggregate would separate. Properly handled, it is very satisfactory.

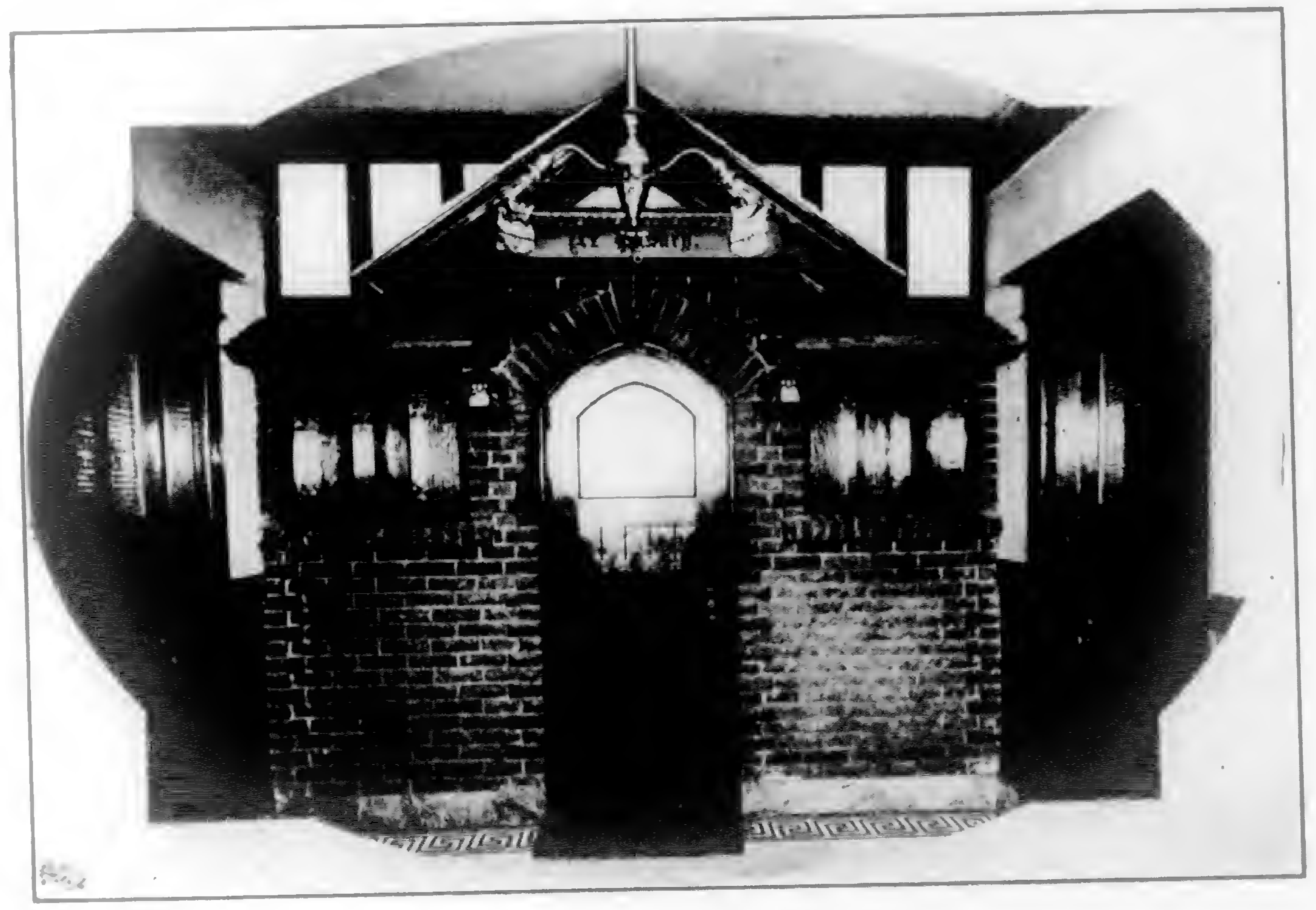
* * *

"Isn't it a terrible thing," said Jones to Brown. "Smith has entirely lost his memory, and can recollect nothing. What can we do to revive it?"

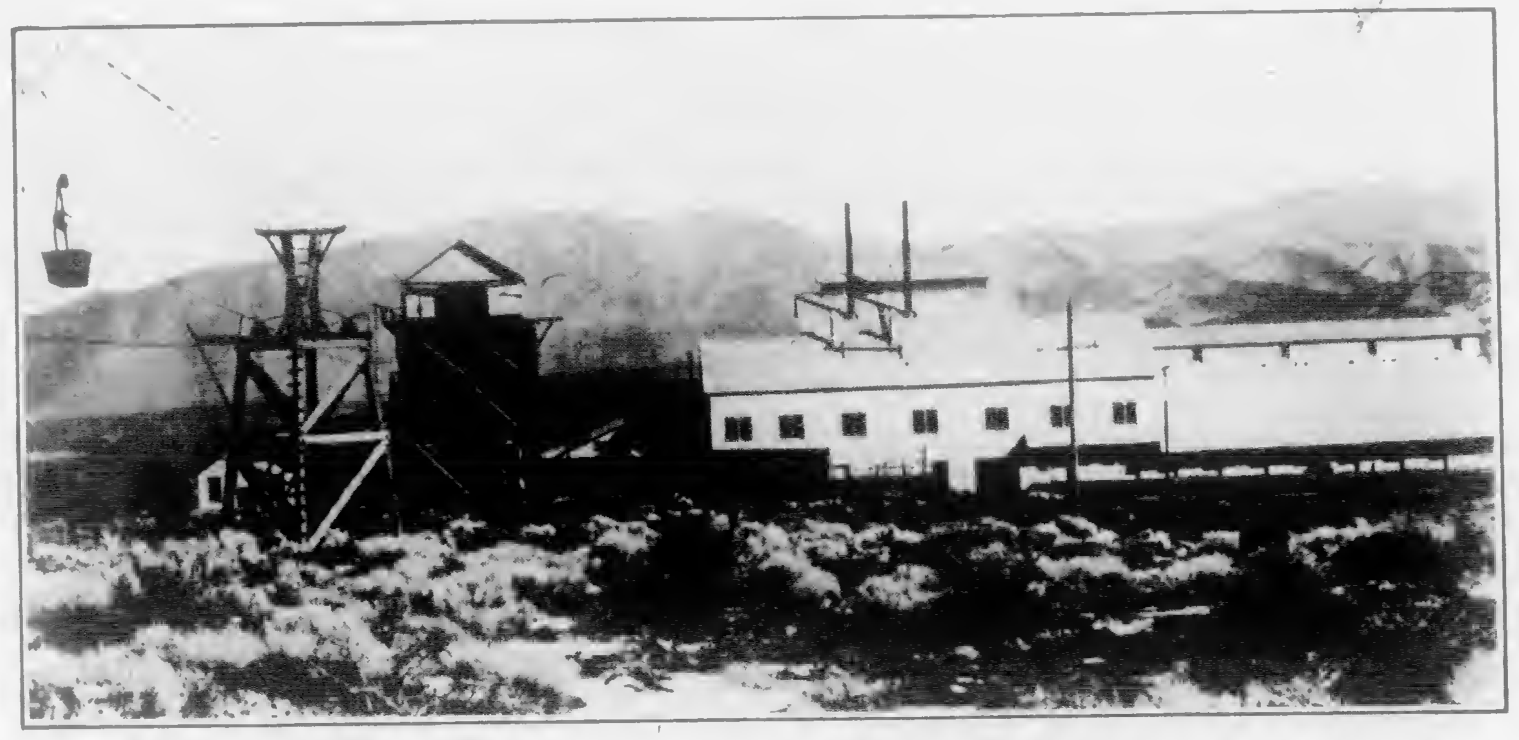
"Nothing," urged Brown. "Let him alone, he's all right—and, besides, I owe him five dollars."



Fourteenth Street Fire House, East Oakland
Fred Soderberg, Architect
Esterly Construction Company, Contractors



Unique Entrance for an Architect's Office



Mill of the Nevada Gypsum Company, Mound House, Nev.

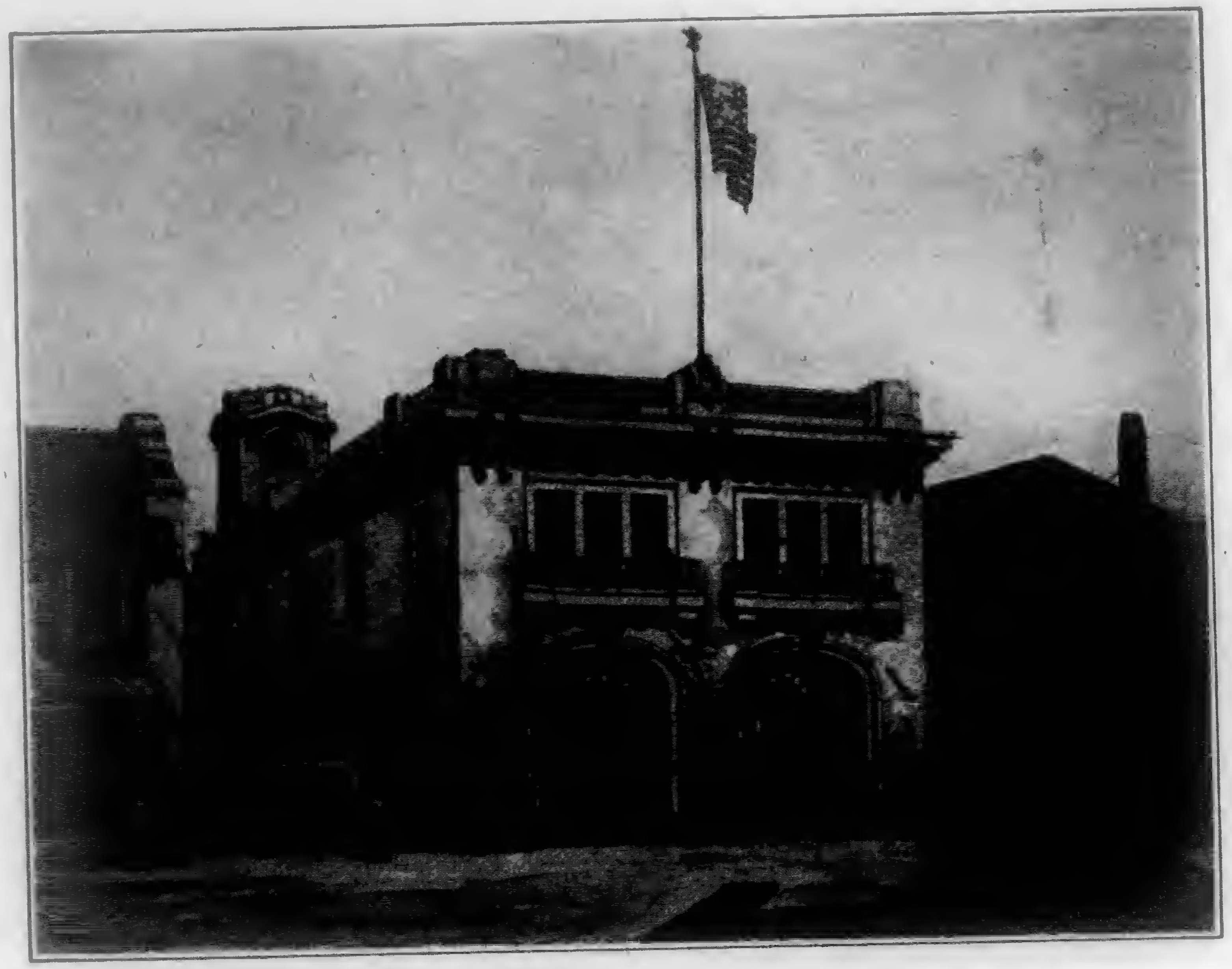
Largest Gypsum Plant on the Pacific Coast

THERE has just been completed at Mound House, Nev., one of the most complete gypsum plants in America. It is owned and operated by the Nevada Gypsum Company, which has recently spent a large sum of money building and equipping a thoroughly modern mill. Mound House is situated at the junction of the Virginia and Truckee and the Carson and Colorado railroads, which excellent rail facilities insure quick transportation to any point on the Pacific Coast. The deposit at Mound House was originally worked in a small way by former Governor Adams of Nevada, treasurer of the present company. Most of the product was shipped to San Francisco, where it had a ready market under the brand name of Empire plaster, which name has been retained by the new company.

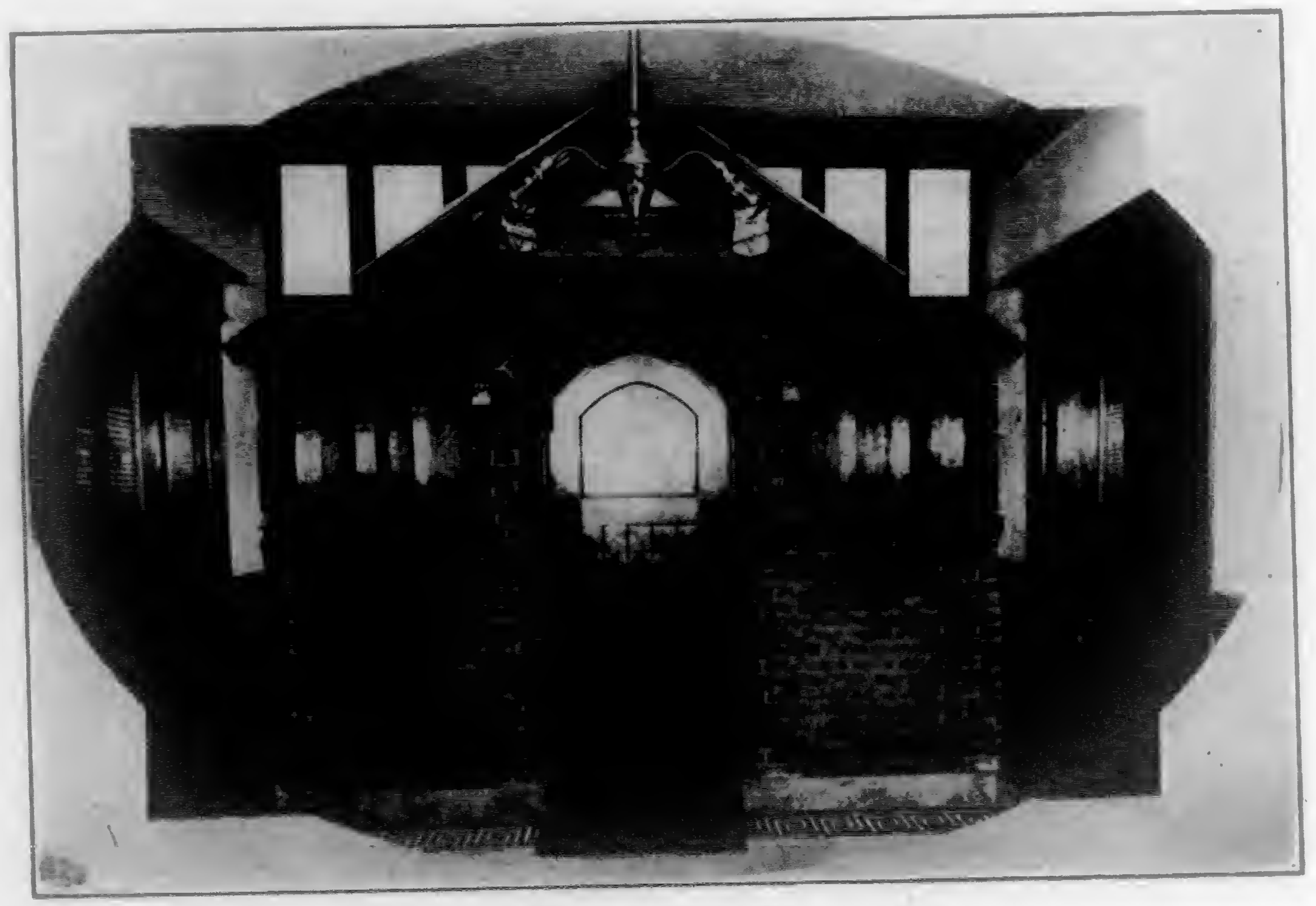
With a view to conducting the business on a more extensive scale, the Nevada Gypsum Company was organized by Nathan L. Bell, its President, under a capitalization of $250,000. Associated with Mr. Bell are Hon. J. W. Adams as Treasurer of the company, F. C. Curry as Vice-President, and Harry T. Cresswell, who, with the other officers mentioned, constitute the Board of Directors.

The new mill, with a capacity of 200 tons daily, commenced operations March 1st of this year. Owing to the purity of the material, capacity of the plant and excellent shipping facilities, the company already is enjoying unprecedented patronage all over the Pacific Coast, and at the present time the works are taxed to their full capacity.

The gypsum rock is delivered from the quarry to the mill by means of an aerial tram 6000 feet in length and having a capacity of thirty tons per hour. The tram, which was erected by the Trenton Iron Works of Trenton, N. J., is operated by gravity, the quarry and rock-crushing plant being 450 feet higher than the unloading terminal at the mill. The rock is carried in steel buckets which have a capacity of 1000 pounds, and the tram delivers one bucket a minute, or sixty buckets an hour. The crushing plant is situated at the loading terminal at the quarry, the latter being worked by means of an open cut, having a face ninety feet in height, of pure white crystalline rock gypsum that analyzes over 96 per cent pure gypsum. It is said to be the most extensive deposit in America.



Fourteenth Street Fire House, East Oakland
Fred Soderberg, Architect
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Unique Entrance for an Architect's Office



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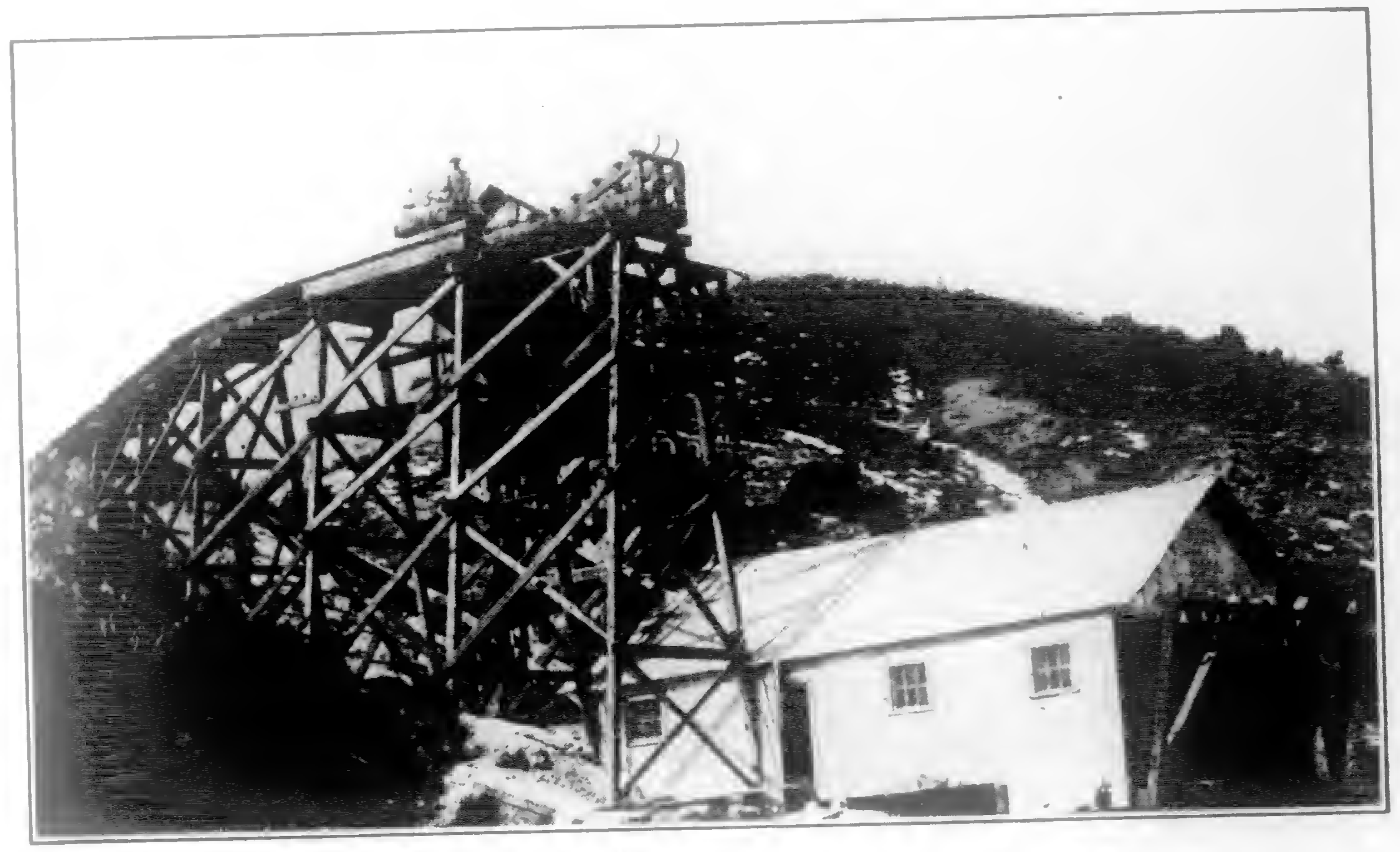
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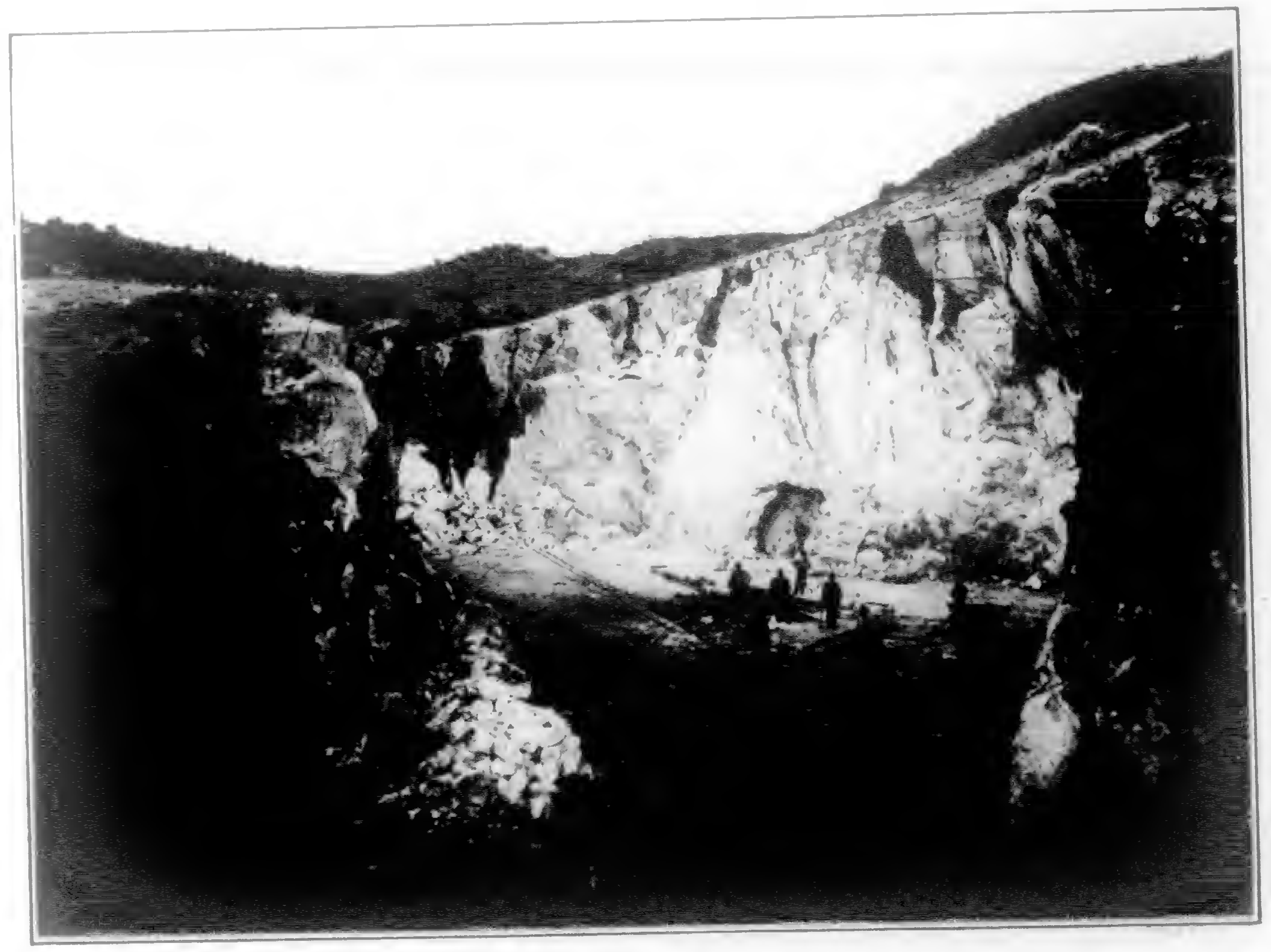
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Beginning of Tramway, Plant of the Nevada Gypsum Company, Mound House, Nev.



Quarry of the Nevada Gypsum Company, Mound House, Nev.

The advantages of a hard wall plaster made from pure rock gypsum over the old lime mortar plaster are becoming more and more apparent to the architect, contractor and owner as its use grows more general, and to-day there is not an architect who has had experience with hard wall plaster who does not recognize its superior qualities. It is being used extensively in the reconstruction of San Francisco, many of that city's best buildings having in them hard wall plaster exclusively. The main advantages of hard wall plaster over lime mortar are its durability, sanitary qualities and saving of time in the completion of a building. It hardens rapidly and, once it has set, does not crack or break off like lime mortar. Its cost at this time is no greater than lime mortar. The walls of a room, when finished with a high-grade wall plaster, are not only sanitary, but are almost equal in hardness to marble or stone, and consequently are not liable to defacement like those finished with soft plaster.

The Nevada Gypsum Company also manufactures Empire land plaster, which as a fertilizer has no equal and is being appreciated by the large land owners of California more and more as its use becomes general. The company, no doubt, will do an extensive business in land plaster, hard wall, finishing and casting plaster within the next year or two.

* * *

What it Would Cost to Rebuild the Pyramid of Gizeh*

In a paper read by Mr. E. S. Wheeler at a recent meeting of the Society of Engineers an interesting calculation was made as to what it would cost to-day to duplicate the Great Pyramid of Gizeh.

This structure, one of the wonders of the world, is founded on solid rock at a depth of about 120 feet below surface level, and rises to a height of 454 feet. Its base covers an area of almost fifteen acres.

Mr. Wheeler's scheme for the reproduction of this pyramid contemplates, first, the setting of a base of concrete. This would represent about 2,600,000 cubic yards of material, and would cost at least $10,000,000. The estimate for the superstructure is about $38,000,000, and it would contain 3,313,000 cubic yards of backing stone and 142,000 cubic yards of facing stone. Mr. Wheeler's estimate of labor is 24,000,000 days.

These figures are cited to show the great engineering skill of the Egyptians, and the fact that no task in construction appeared to be too large for a people whose extant monuments showed their patience and ability to overcome obstacles that would daunt even the modern engineer.

* * *

Architectural Repartee

Michael J. Garvin, architect of the new Bronx Court House, was one of the witnesses a few days ago at the continuation of the Haffen inquiry before Wallace Macfarlane. He was asked by Commissioner of Accounts Mitchel at one point:

"What is the function of a cornice?"

"Its function is the same as the hat upon your head," was the reply.

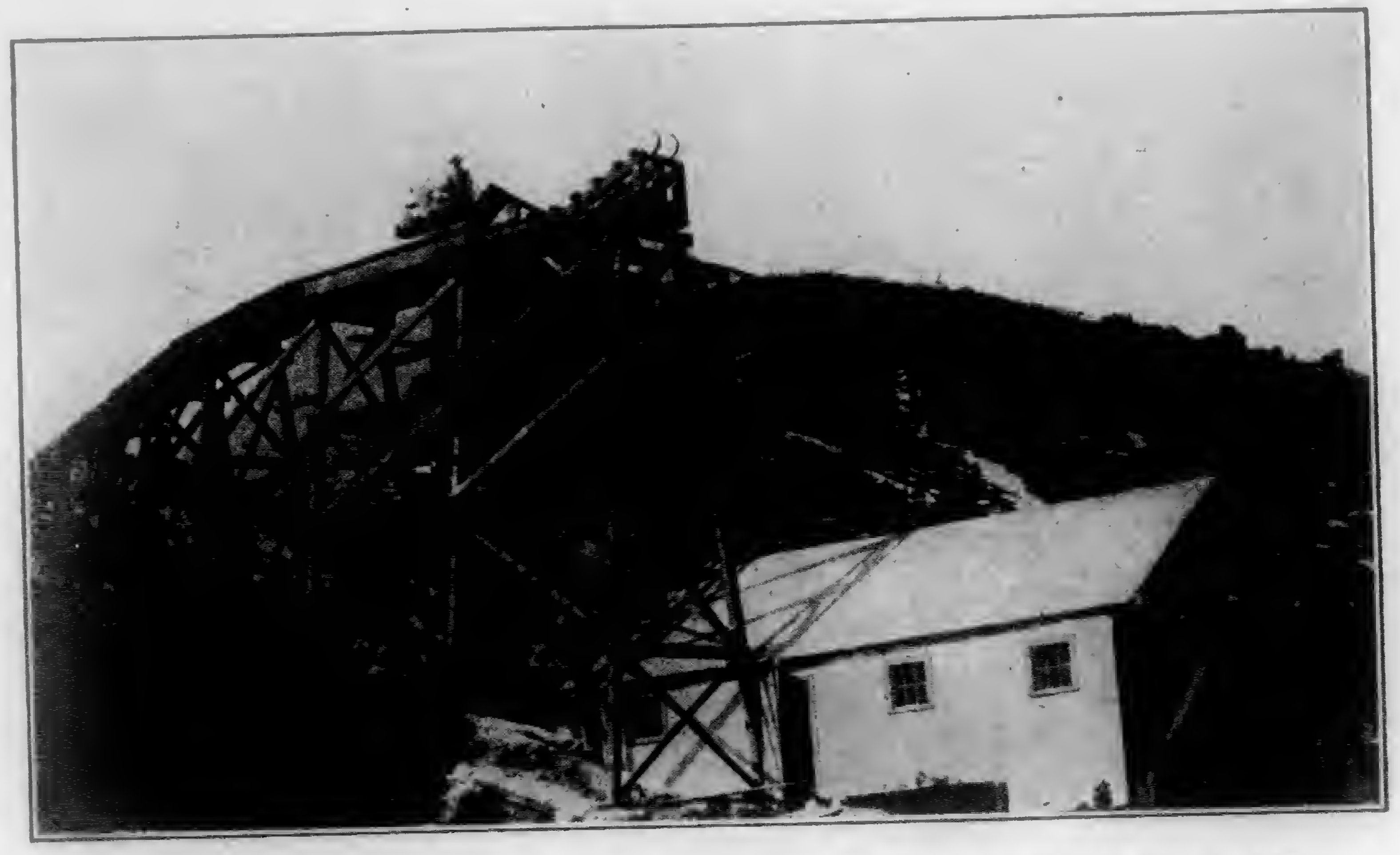
"And that is?"

"To decorate what's underneath it," said Mr. Garvin.

Later he was asked what types of architecture certain well-known buildings in the city followed. Among others, the Singer building was mentioned.

"I don't know; I think it follows the Tower of Babel," said the witness.

*An excellent article on the Pyramid of Gizeh appeared in the January and February numbers of The Architect and Engineer.



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Central Building, Seattle, Wash.

Mahogany for Interior Finish

THE cut shown above is a good reproduction of the Central Building in Seattle, which is of special interest to architects and builders because of its interior finish—being entirely of Philippine mahogany. The wood in this building has been pronounced the finest of its kind on the Pacific Coast. Philippine mahogany is especially desirable for the interior trim of buildings like the Central on account of the unusual length, width and clearness of the boards, as well as its beautiful figure and grain.

The number of buyers of mahogany in this country's hardwood market is now exceeded only by those of oak, maple, poplar, basswood, ash, birch, chestnut and cypress. The principal reason for the popularity of mahogany is that the importers of the logs and the manufacturers of lumber have never advanced its price beyond a modest profit, and it is relatively so low that it now makes little difference in the cost price whether an office building or a home is finished in mahogany or quarter-sawn white oak.

Another reason for its popularity is because it improves in tone with age. After much experimentation car builders finish practically all of their cars in mahogany, as it withstands satisfactorily the severe usage and also holds its finish. The chief centers of mahogany importation and manufacture are Boston, New York, Louisville, New Orleans, Chicago and Indianapolis.

The mahogany is the wood of a tree of Swietenia, of the natural family of Cedrelaceae, named Jaquin, in honor of J. Van Swieten. The tree is one of the most majestic and beautiful, with large, spreading head and pinnate shining leaves. The trunk is often 40 feet in length and 6 feet in diameter, and is divided into many massive arms.

In the London Timber and Trade Journal there appeared recently an interesting historical reference to the mahogany trade in England. According to this writer mahogany wood was first imported by England in 1724, although in 1597 Sir Walter Raleigh demonstrated the great value of this wood, which was used in repairing his ships at Trinidad. From 1724 until the discovery of the mahogany forests of Africa, by Stanley, England and Continental Europe were heavy purchasers of mahogany from the West Indies, Honduras and Mexico. A great part of the mahogany used in this country in the early years came from Europe, it having first reached there from the West Indies, Mexico and Honduras.

A correspondent offers the following suggestions for finishing Philippine Mahogany:

"We find that the very best results in finishing are obtained by using a water stain and a contrasting filler. We have had our best success with a black filler, and our process of finishing has been as follows:

"When the lumber has been cleaned and ready for the finish to be applied we would put water over the face of the lumber with a rag and permit the grain to raise in this way, then sand this down and put in the stain thereafter. Then put in the filler with the advantage that the raising of the grain prevented the rough appearance which is common when a softer wood is not so treated. When the grain raises with the stain it makes a bad job and we would advise you to take a little more pains in applying the stain and get much better results."

* * *

Natural Stone Business Demoralized

MR. GEORGE J. HENLEY of Sespe, Ventura County, California, sends a somewhat discouraging letter to Stone, a magazine devoted exclusively to natural stone, relative to the condition of the stone trade on the Pacific Coast. The magazine in question considers Mr. Henley's words well worth quoting, arguing that they may aid in arousing stone producers everywhere to the necessity of making a vigorous and unceasing fight on behalf of natural stone and against cheap substitutes. Mr. Henley says: "There is nothing doing at this place at present, and very little in the othre quarries of southern California in the building line. The city of Los Angeles employs less than six stonecutters, outside of the postoffice, now in course of construction. Reinforced concrete has taken the country for the time being. At one time over seventy men were employed in yard and quarry getting out and working the Sespe brownstone. Here is an instance of the failure of artificial stone put into a church erected some two years ago, corner of Figueroa and West Ninth streets, Los Angeles. When put in the building it was a good imitation of Sespe as far as color was concerned, and was greatly admired by the uninformed public. I then predicted it would not hold color two years. The other day I had occasion to pass the place and, behold, the beautiful purple brown had vanished, even on the shady side of the structure. The cement color and alkali are now strongly in evidence, and will continue, while the sun and weather will destroy the last vestige of brown."

* * *

Very Difficult

"I am to be vaccinated," she said. "It mustn't show, you know."

"And where," we inquired, "do you intend to have it done?"

"Ah that's the question!"

So saying, the Salome dancer shook her head sorrowfully, almost despairingly.

Architect must be a Good Guesser

IT is positively appalling to consider the weight of responsibility put upon the architect by the public in the matter of guessing. A client comes to an architect with the request to design for him a house that shall contain so many rooms, of such and such sizes, and with an equipment and finish that shall be thus and so. In the course of time the design reaches its preliminary stage of completion, where all requirements have been met, the plan is satisfactory, and the details of heating, plumbing, lighting and finish are roughly determined. Then comes the demand upon the architect's guessing power; the owner wants to know just how much it all will cost. In a case at hand the architect had applied the usual rules of thumb, estimated the building's cubical contents, multiplied it by a cost price per cubic foot obtained in previous experience with the same kind of work, and registered his "guess" as $12,000. The work went ahead; the working drawings, scale details and specifications were made and put out for bids. And here comes the real point: With all the data before them, with rigid specifications and full details, the eight contractors submitted bids ranging from about $11,000 to $16,000. There is no moral; the point we want to make is that accurate guessing is an attribute of the practicing architect that is occasionally overlooked. Among the almost innumerable branches of knowledge in which he is called upon to be fully equipped, from the theory of acoustics to the extermination of red ants, dependable guesswork occupies an important place.—Ex.

* * *

Wood Displaces Steel for Building

THE San Francisco underwriters have adopted a new type of building construction for one of their own buildings, and construction is in progress. The new building is creating much interest among real estate men, builders and architects, especially as the underwriters have looked favorably upon it. The architect, John Cotter Pelton, who originated this type of building, says he has an assurance that it will receive a fire insurance rating higher than Class C buildings, and next to Class A. He estimates the cost at about 15 per cent greater than ordinary frame buildings, and at least 5 per cent less than the common brick structure.

The building consists of a heavy frame of wood encased in reinforced concrete walls of four inches thickness, anchored to the frame at each story. It is, in fact, a wood frame in place of a steel frame, and the heavy timbers support the floors and roof independently of the walls, which are merely "curtain walls." There are wood columns and girders, and upon the girders, after they are covered with fireproof material, the wood joists are laid sixteen inches on centers. Instead of board flooring, blocks composed of cement, plaster of paris and cinders, are set upon the joists, so that the floors are fireproof. The partition walls are made of similar blocks, made of staff and held in place by reinforcing rods.

In no place does wood touch wood in the building. The frame may be erected as steel frames are put up, and later the walls are built, and the floors set in. The principle is the same as that of the steel-frame building, in which the floors are supported by the frame, independently of the walls. The inventor believes that the favorable attitude of the underwriters may result in allowing this type of construction to be used within the fire limits.

A Linoleum Wearing Surface for Concrete Floors

By S. W. RUSHMORE in Cement and Engineering News.

I HAVE read in many papers descriptions of many fine concrete buildings, and in every case, in offices, the floors have been covered with hard wood, which introduces a large amount of combustible material in a building supposed to be fireproof.

I recently built a concrete extension to my factory and, having no external fire risk and the goods manufactured being non-combustible, I decided to use as little wood as possible and carry no insurance.

The contractors recommended maple flooring for the office and I found that that material was commonly used elsewhere; but I would not have it. I had observed that good quality linoleum would wear better than wood, so I had the office floors trowled off smooth and decided to cement the linoleum directly to the cement surface.

None of the linoleum concerns would take the contract, as they said "the moisture in the concrete will loosen the cement;" but I did not agree with them, so I had the linoleum fitted to the different rooms and did the cementing with my own force.

After carefully fitting the material to the edges of the room, the men would roll it back from one-half the space, carefully sweep the floor and scrape off any unevenness. Then the cement surface was covered to a depth of about 1/16 inch with liquid fish glue thinned down slightly with hot water so that it would be worked with a large kalsomine brush. On many places the glue would be fully 1/8 inch deep and we have observed that there is little danger of applying too much.

After coating the surface with glue the linoleum was carefully rolled back into place and for a few minutes a dozen laborers would walk back and forth over it to ensure even contact. Then the operation would be repeated over the remaining half of the room. As soon as the covering was laid, the entire surface was covered with brick, sections of structural steel and other peices of flat, heavy material and allowed to remain for several days.

It was found that the glue would quickly harden at the seams and edges, but remained moist elsewhere for several months. Nevertheless, the atmospheric pressure was sufficient to prevent the slightest buckling at any point, even under constant use, and to-day, after over twelve months' hard service, we have an ideal floor surface.

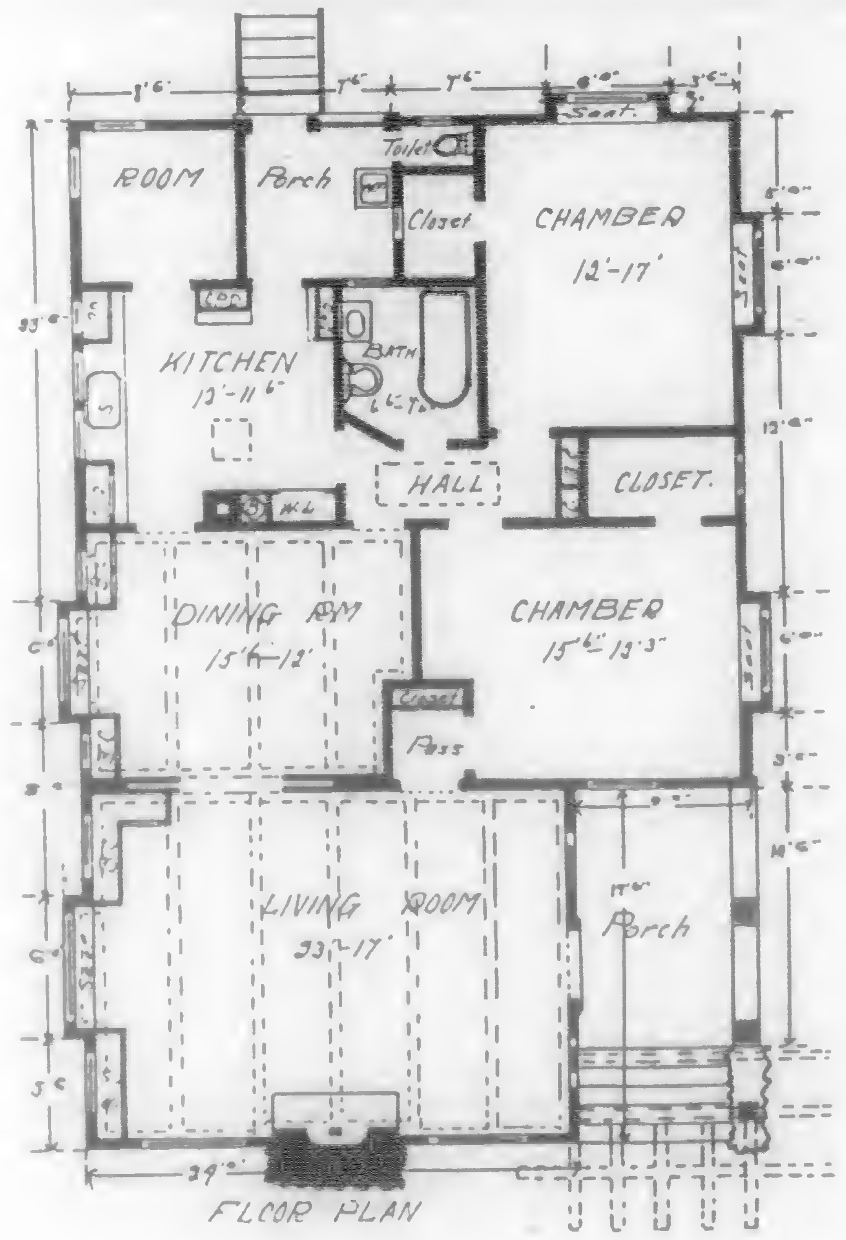
The floor is almost as quiet as if covered with rubber, yet it has the feeling of wood and the firmness of cement. When wiped over occasionally with linseed oil and turpentine, it remains perfectly waterproof.

The linoleum for the surface of about 4,000 square feet cost $400 cut to fit the rooms. We used just fifty gallons of liquid glue at a total cost of $85. The labor amounted to about $95, including the carrying of the large amount of brick for weighting the surface. Thus the total cost was but 14½ cents per square foot, probably less than half the cost of the average maple floor.

As our partitions are all of reinforced concrete five inches thick poured in place, and the only woodwork is about the door openings, we consider our offices practically fireproof. Even if it were possible for the linoleum to burn off from the cold concrete surface, its calorific value is so small that it would not add appreciably to a fire.



Exterior of a Bungalow in Neglee Park, San Jose. Wolfe & McKenzie, Architects



Floor Plan of a Bungalow in Neglee Park, San Jose. Wolfe & McKenzie, Architects

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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First Vice-President...Ralph Adams Cram, Boston, Mass.
Second Vice-President......Irving E. Pond, Chicago, Ill.
Secretary and Treasurer.....Glenn Brown Washington, D. C.

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Cass Gilbert (ex-officio).............New York,
Glenn Brown (ex-officio).....Washington, D. C.
Walter Cook.........................New York
S. B. R. Trowbridge.................New York
J. L. Mauran...................St. Louis, Mo.

Board of Directors for 1909

For One Year—Walter Cook, 3 West Twenty-ninth street, New York; John Laurence Mauran, Chemical Building, St. Louis; Edgar V. Seeler, Real Estate Trust Building, Philadelphia.

For Two Years—Frank Miles Day, 925 Chestnut street, Philadelphia; George Cary, 184 Delaware avenue, Buffalo, N. Y.; R. Clipston Sturgis, 120 Boylston street, Boston.

For Three Years—Frank C. Baldwin, Union Trust Building, Detroit; S. B. R. Trowbridge, 527 Fifth avenue, New York; John M. Carrere, 225 Fifth avenue, New York.

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Vice-President ....William Mooser
Secretary-Treasurer....Sylvain Schnaittacher
Trustees..................Henry A. Schulze, William Curlett

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Vice-President.....................J. Lee Burton
Treasurer..................August Wackerbarth
Secretary...............Ferdinand Parmentier

Board of Directors

A. F. Rosenheim, Octavius Morgan, Arthur B. Benton, C. H. Brown, R. B. Young

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Treasurer....................Myron Hunt Los Angeles, Cal.

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OFFICERS FOR 1909

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Vice-President.....................Charles Sawyer
Secretary-Treasurer.............William Betts

Portland Architectural Club

OFFICERS FOR 1909

President.......................Jos. Jacobberger
Vice-President ....Edgar M. Lazarus
Secretary ....Ernst Kroner
Treasurer ....John G. Wilson

Washington State Chapter, A. I. A.

OFFICERS FOR 1909

President..............................C. H. Bebb
Secretary...................Arthur J. Russell
Treasurer........................J. F. Everett

Granted Certificates to Practice Architecture.

Following is a list of those who have been granted certificates to practice architecture by the Northern District of the California State Board of Architecture.

Mr. William Wright, 2245 Benvenue avenue, Berkeley.

Mr. Louis Mastropasqua, Monadnock building, San Francisco.

Mr. Walter D. Reed, Oakland Bank of Savings building, Oakland.

Mr. Leo J. Devlin, 145 Buena Vista avenue, San Francisco.

Mr. Thomas Smith, 1801A Ellis street, San Francisco.

Mr. Augustus G. Headman, 740 Haight street, San Francisco.

Mr. Boyd von Beuthuysen, 22 Battery street, San Francisco.

Annual Meeting of the State Board.

The California State Board of Architecture held its annual meeting at the St. Francis Hotel, San Francisco, in April, at which were present the full membership of the board from the northern and southern districts.

After having heard the reports of the secretary-treasurer, the board proceeded to elect officers for the ensuing year. The following were elected: William Curlett, president; John P. Krempel, vice-president; Frederick L. Roehrig, secretary-treasurer; Lionel Deane, assistant secretary-treasurer.

Merritt J. Reid and Albert Pissis of San Francisco, W. S. Eames of St. Louis and Alfred F. Rosenheim of Los Angeles, past members and guests, were in attendance and spoke.

The meeting was enlivened by the presence of John Galen Howard, professor of architecture at the State University. Mr. Howard thoroughly indorsed the workings of the State law governing architecture, and expressed a desire to work with the board in formulating ideas so that the members of the university might avail themselves of its benefits.

All present recognized the educational value of the work of the State board in its endeavor to encourage architects to equip themselves for their chosen profession, to the end that any person who desired to call himself an architect must show the necessary qualifications.

During their stay in the northern metropolis the members of the southern district visited many of the new buildings erected since their last visit.

City Architect Newton Tharp acted as host to the party while visiting the various municipal buildings under construction. He has a bureau of seventy engineers and draughtsmen employed entirely in the preparation of plans, etc. At present he is at work on plans for forty school buildings, twenty engine houses, Hall of Justice and several hospitals.

San Francisco Chapter, A. I. A.

By SYLVAIN SCHNAITTACHER, Secretary.

The regular quarterly meeting of the San Francisco Chapter, American Institute of Architects, was held in the white and gold room of the Hotel St. Francis on Thursday evening, April 15th. An unusually large attendance was present, including several visiting architects.

After the customary dinner the meeting was called to order by Mr. Pissis. The greater part of the evening was taken up with the discussion of the proposed competition for the new San Francisco City Hall, and a committee consisting of Messrs. William Curlett, George B. McDougall, William Mooser and Henry A. Schulze was appointed to draft a letter to the Board of Supervisors, requesting the modification of the proposed program, in accordance with the sentiment of the chapter. Other business transacted was of the usual routine nature.

Southern California Chapter, A. I. A.

Southern California Chapter, A. I. A., held its monthly dinner and business meeting for April in Levy's cafe, Los Angeles. Aside from the regular routine business, the principal topic discussed was that of the proposed school buildings, plans for which are now being made by various architects. The members were loud and long in stating their objections to the use of inflammable material in the construction of these buildings. The plan of the School Board is to erect none but wooden buildings. With the addition of probably not to exceed 25 per cent to the amount of bonds recently voted for increased school facilities, it was claimed that absolutely fireproof schools could have been secured.

If the chapter had mentioned the many points favorable to fireproof school construction prior to the time of voting the bonds, its comments would surely have received hearty indorsement from the taxpayers, whose children's lives are daily endangered in the frame structures now in use, and the bonds voted for wooden buildings would no doubt have received a greater majority had the bond election called for the added cost of fireproof schools. But, inasmuch as the objections to frame buildings come at this late date, it is hardly possible any changes will be made in the construction of the new grammar and high schools, for which $720,000 will be expended.

Olympic Club Competition.

The plans for a club building of Charles Paffe & Co. and J. Bauer, with offices in the Merchants' Exchange building, San Francisco, have been accepted by the Olympic Club in competition with designs submitted by some twenty or more prominent architects. The award was made by the club building committee, assisted by G. M. Kellam and John J. Mahoney. The firms of Sutton & Weeks, Coxhead & Coxhead and MacDonald & Applegarth were next in line in the order named to the successful competitor. The estimated cost of Paffe & Co. to build the structure is $379,000. The plans call for a Class A building of steel, stone and brick, five stories and having the swimming tank, already constructed, under a separate roof from the main building. The gymnasium is to be on the first floor, right off the foyer. On the second floor will be located the assembly and social halls, while the other three floors will be given over to the cafe, lounging-rooms and sleeping-rooms.

More About San Francisco's New City Hall.

A bond issue of approximately $4,000,000 for a new City Hall will probably be put before the voters at a special election some time in June. Supervisor McLeran so announced at a recent meeting of the building committee considering the general matter.

That the hall will in all likelihood be erected upon the site of the structure now being cleared away was also tentatively determined upon, although the meeting was largely taken up with the Merchants' Association suggestion that the Burnham civic center idea be carried out to the extent of locating the new hall in the vicinity of Van Ness avenue and Market street. President Andrew M. Davis and Secretary L. M. King of the association stated that they did not wish to press the proposal unless the additional expense involved had been ascertained, nor without further conference among the members of the association.

Supervisors McLeran, Bancroft and Chairman Rixford took the ground that the work must not be delayed, and that unless the association should shortly make a definite recommendation to the contrary, the board would proceed upon the assumption that the present site be used.

G. H. Lansburgh and other representatives of the San Francisco Chapter, American Institute of Architects, condemned the committee's former proposal, that of the $15,000 to be put up in an architectural competition for plans $10,000 should be distributed among ten firms specially asked to submit designs.

An absolutely free and open competition, with all architects and firms upon the same basis, was advocated by the architects present, and, the Supervisors' finance committee having thrown back the $10,000 proposal without favor, the committee did not press its former idea.

It was agreed that a better plan would be to use the entire amount in stimulating competition, and it was decided that a bill along that line be introduced. The winning architect will receive 4½ per cent of the cost of the structure. It is proposed that the four plans adjudged next in merit should receive prizes as follows: Second best plan, $5000; third, $4000; fourth, $3500; fifth, $2500.

The board of award as at present planned consists of the Mayor, the City Architect and three other architects to be chosen by the Board of Works.

A Palace for Fresno?

Whether the city of Fresno is to have a palace worth $1,000,000, or whether that amount of cash is to go to the University of California, is a question soon to be decided through a case now pending in Fresno.

When Theodore M. Kearney of Fresno died he left a will that has brought about much legal conflict. It is claimed that his final testament provided that $1,000,000 should go to the University of California. On the other hand, the contention is made that the money was to be devoted to the erection of a magnificent palace to be known as the Chateau Fresno, which would be a monument to his name. There are further complications in the shape of hints regarding a mysterious woman with whom Kearney was in love and who was to share the bulk of the estate.

Before Kearney's death Maurice Herbert, an architect of Los Angeles, drew plans for the proposed chateau. The fee he charged was $58,000, and it is for that amount that he is now suing in the Superior Court of Fresno.

If he wins the suit, this will go far toward establishing the fact that Kearney intended having the building erected. The Mercantile Trust Company of San Francisco is executor of the estate.

To Build Theaters.

Abe Cohn, manager of the American Theater of San Francisco, Western representative of the Shuberts, announces that the work of constructing a $250,000 theater in San Francisco will be started shortly. A $300,000 theater is to be constructed in Oakland, on Broadway, near Fifteenth street and the Oakland postoffice building. A new theater is also to be built in Bakersfield, possibly one in Stockton, and the Shuberts will control the new playhouse which the Elks are about to build in Sacramento. Plans have been matured for the construction of a new theater in Los Angeles.

Sacramento Bank Building.

The directors of the People's Bank of Sacramento are active in amicably arranging with the tenants of their property on Eighth and J streets to vacate, in order that building on the site may be started in the next few months. It is planned to erect a class A structure seven stories high, and all floors will contain modern office rooms, to be absolutely fireproof. Not a stick of wood will be used in the building, and all door and window casings will be metal sheathed.

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THE ARCHITECTURAL LEAGUE OF THE PACIFIC COAST

The Architectural League of the Pacific Coast has been successfully launched, and, if the plans of its organizers do not miscarry, it promises to become an important factor in the future movements of the profession in California, Oregon and Washington. The League is, indeed, fortunate in having for its first president Mr. Willis Polk, whose high professional standing, enthusiasm in and loyalty to his work should be ample guarantee that the organization will not suffer for proper management and a faithful pilot. There is no good reason why the League should antagonize other architectural bodies; on the contrary, it should work in harmony with them, having in mind the main purpose of all similar organizations—to promote and maintain the highest possible standard of professional etiquette.

The League should have the co-operation and support, in so far as practicable, of the national bodies—the American Institute of Architects and the Architectural League of America. As stated, it is in no sense an insurgent movement, being prompted solely by a desire to simplify a circuit of architectural exhibitions to be held in different Coast cities. The American Institute of Architects should not and will not suffer through the holding of these exhibitions; in fact, the entire profession is certain to be benefited by them.

The League proposes to encourage the formation of chapters of the American Institute of Architects in cities where none now exist. It proposes to encourage study by draughtsmen through existing architectural clubs and foster the organization of clubs in cities where none now exist.

It proposes to bring about, if possible, an annual convention of Pacific Coast architects.

Members of all chapters of the American Institute of Architects, as well as members of other architectural organizations, are included in its membership, the idea being to simplify the holding of annual exhibitions.

In this way it will be possible for all Pacific Coast architects to have the opportunity of showing their work in all the Coast cities at a minimum of expense and without the conflict that would ensue if two or more independent exhibitions in different cities happened to be undertaken at the same time.

MESSINA TO BE PROPERLY REBUILT

Prof. C. W. Wright of the Geological Survey has just returned from Italy's stricken district and in a lecture at the Cosmos Club said that undoubtedly a type of structure that will have great resistance to shocks will be adopted for the rebuilding of Messina, and it will be for the Government to see that this type alone is used.

Engineers and architects were much interested in the description of the hollow-tile building that of all the different kinds of construction in Messina best stood the tests of quake and fire. This hollow-tile construction, reinforced with steel members, will in all likelihood be adopted as the standard mode of construction and insisted upon by the authorities.

Reinforced concrete also withstood the quake stresses very well, and this material will probably be used second to hollow tile.

The treatment of exterior surfaces of concrete buildings by the use of cement plasters is a study just challenging attention in America. In Europe this branch of the industry has been developed into a fine art. In plastering technique we in this country are very remiss. Not every mechanic is fit to handle the finishing processes. It will take several well equipped demonstrating schools to secure the progress in this direction that the industry needs. What utilitarian institution of learning will be the first to provide for this important study?

THE EAST APPROVES PACIFIC COAST LEAGUE.

From the American Architect.

ON another page will be found a news item announcing the formation of an Architectural League of the Pacific Coast. With the marked progress of the Western coast in architecture of recent years the need for an organization of this kind has been keenly felt. It has been impossible to arrange any satisfactory method by which the architects of both East and West could enjoy together the advantages of a common exhibition circuit. Owing also to the magnificent distances involved and the tendency to hold the annual conventions of the institute in the East, the men along the Pacific Coast have not had the opportunities for meeting together in large representative bodies that they have desired. Local associations have a very great value in themselves, but they can never completely fill the need for a broader and more comprehensive organization. With the formation of the new league there is filled a gap that has for long been felt. The chain is completed between the local societies on one side and the institute on the other. * * *

Particularly gratifying is the attitude of the men to whom the credit is due for the new league's existence. It is at least conceivable that the Western men might have been so impressed with their geographical unity and their separation from the center of the Eastern organizations as to consider advisable the formation of a body that would be in effect a rival of the A. I. A. A movement of this sort would have been unfortunate in many ways. The institute has gained for itself a standing and a widespread influence for good that will, so far as it is possible to foresee, grow steadily in power. Any addition along the line of more complete organization within and subordinate to it is a step in the right direction. On the other hand, any division of the architectural profession's loyalty would weaken its influence for good. That the Western coast architects fully appreciate this fact is shown by the published summary of their objects in organizing the Architectural League of the Pacific Coast. Their aims are: To secure affiliation between the A. I. A. chapters and the Western architectural clubs; the formation of similar organizations in cities where none exist; the institution of a Western circuit of architectural exhibitions; the establishment of an annual convention of architects in the West, and the development of educational work among the draughtsmen, along the lines of the atelier system. Our congratulations are extended to the men on whose shoulders the labor of this movement has fallen. The whole profession will watch their efforts with the satisfaction that comes from seeing work that is worth the doing well done.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

School Plumbing.

By A. C. Shaver,
Inspector of Plumbing, Pasadena.

SANITATION in our public schools is receiving far more consideration than at any time in the history of architecture. Not only is this true in regard to the modern systems of heating and ventilating, but also in the wonderful improvement in plumbing, both as regards the drainage system, water supply and fixtures. While formerly plumbing fixtures were placed in illy ventilated, poorly lighted, out-of-the-way places and used only as a necessity, they now occupy a more prominent place and have become a luxury as well as a necessity.

When it comes to a question of plumbing the schools where the boys and girls of to-day are learning the responsibilities of the men and women of to-morrow, it ought to be a self-evident proposition that the best can be none too good. A city's educational institutions should reflect the very highest state of knowledge and practice of sanitary engineering — partly because they are educational examples of public buildings as well as places where education is imparted; also because children have no power of choice in the design or construction of the plumbing in the schools they attend. The municipality is morally responsible for the health and comfort of the children who attend its places of public instruction.

It is not enough that the plumbing fixtures be sanitary; they must be such that the children take pride in them and feel a sense of responsibility in keeping them clean. The public drinking cup has always been a source of trouble on account of the possibility of the spread of disease, but this has been overcome by the introduction of the bubbling pedestal drinking fountain in which no cup is used; the child, leaning over, drinks out of a bubbling stream of water, no part of the lips coming in contact with the fountain. The improvements in plumbing fixtures have driven out the old latrine closets and the more antiquated systems with their large fouling surface, and have created a demand for the more sanitary and up-to-date work; the individual, seat-action, syphon jet closet, with its tank and bowl of vitreous ware, is probably giving the best satisfaction, and when installed in a well lighted, well ventilated room is a model of sanitation. If the privilege of using modern fixtures in a clean, ventilated room shall teach our children anything toward cleanliness and care of property and do anything toward raising the standard of sanitary knowledge, any extra amount paid is well invested. The policy of putting high-grade material in rooms to be used for toilet purposes has often been assailed by unthinking persons, and probably often will be; but it is certainly a step in the right direction, as it is a saving in repairs, length of service and the ease with which it is kept in a cleanly condition.

Owing to the nature of the waste that enters the urinal, it is the most difficult of all toilet-room fixtures to keep in a clean and sanitary condition, and the foul

air noticed in many public toilet rooms is due largely to this fixture; but this can be overcome by the proper selection. A urinal should be of a non-absorbent material such as slate or solid porcelain, and the water so delivered as to have a scouring effect on all parts; the local vent so arranged as to draw the air downward across the bowl or trough, as the case may be, and exhaust back of the urinal slab in a foul-air flue installed for that purpose. With this installation we do not get the foul odors, as they are drawn downward and never reach the level of the face.

Dr. Arthur Newshalme, a distinguished English sanitarian, once said: "The children represent the raw material out of which the next generation is to be manufactured." It is important that not only should this material be as good as possible, but it should be prevented from deterioration while under the control of school authorities. Realizing that the most priceless possession of our boys and girls is not learning, but health, we must so guard and strengthen them during the most plastic period of their lives that when the school days are over they may enter the world well and strong, physically equipped to maintain the advantages already gained.

Architecture and Illumination.

In an address upon "Architecture and Illumination" at a recent convention of Illuminating Engineers, Mr. Emile G. Perrot said that illumination might be divided into two parts, necessary lighting and decorative lighting.

While these two divisions necessarily merge into each other, their relative importance depended upon the general character of the architectural treatment of the building. If the building was considered as a structure intended to serve the practical uses of man, the illumination would be of the former type. If, however, architecture was considered in its real significance as being ornamental construction, one of the fine arts, and possessing, in addition to its technical value, esthetic and phonetic values—that is, beauty and power to tell a story—then illumination became only the handmaid of architecture, as were painting and sculpture.

Mr. Perrot believed that the architect should design the fixtures for a building just as he designed the carving for a column capital or the bas relief enrichment of a frieze, for the use of stock patterns for any feature of a building was reprehensible. On the other hand, nothing was more striking in a building than a lighting fixture when in use at night time.

The Singer building in New York was referred to as a successful combination of architecture and illumination, while the illumination of the Pan-American Exposition of 1901 was given as an example of the utmost degree of harmony between illumination and exterior architectural effects.

In conclusion Mr. Perrot referred to the necessity for the collection of data bearing on both the theoretical and practical sides of illumination for the use of those taking up the profession.

Plumbing for Water Service in the Home

The distribution of water service in the home is discussed in a recent article in Shoppell's, which says in part:

All water pipes laid outside of a building (where there is frost) should be so far below the surface of the ground that the frost will not reach them—usually from three to four feet, according to the porosity of the soil and the condition of the climate. (In California the excavation need not be quite so deep.) It is prudent to have a stop-cock box outside the building, so that the householder will be able to control the whole line from the street line to the cellar, where another stop cock or wheel valve, with waste tube or opening, should be provided to allow of the emptying of all water pipes when the valve is closed. This waste opening is necessary to prevent any water remaining in the pipe from freezing in cold weather, and to allow the pipe to drain when repairs become necessary. The stop cock outside the building makes the householder independent in the control of his own water supply.

The service pipe should be laid with an even grade to the stop cocks, to enable the water to be properly drained when required. If any sags or depressions occur the water will lodge and cause trouble. The proper way to support a water pipe of lead in a building is to fasten a board with a "ground" under the pipe, and this will furnish a good support the entire length of the pipe. Pipe hooks, bands or tacks should never be used for supporting horizontal pipes of any kind, as the lead pipe will of its own weight sag between these supports, especially hot water pipes. The heating of the pipe will cause it to elongate, and it will never return to its original position.

The size of the pipe from the main to the building should be considered, taking into account frictional loss, distance run, and the needs of the building, to establish a perfect service. It should be ascertained just how high the water will rise, before plumbing work begins, because the system of piping, or the method of supplying and distributing the water best adapted for the building, will depend chiefly upon the height to which the water can be depended upon to rise. This height can be ascertained by applying a pressure gauge to the service pipe and computing the vertical height of a column of water required to counterbalance the pressure indicated. It often happens that the water will rise and supply the top floors of a building during the night, but not during the day. This is due to larger quantities of water being drawn from the street mains during the day than during the night. When such a condition as this is encountered, a common house tank should be located above the highest fixture, large enough to hold a three days' supply.

Indirect Illumination.

By Augustus D. Curtis.

Indirect illumination is acknowledged by all who make a study of artificial interior illumination as the most aesthetic and modern method. This form of illumination having the light source concealed and usually depending upon reflection from ceiling, walls or other reflecting sources for an even illumination of the room has been limited in its practical application, owing to the great loss or absorption of light after leaving its original source before it reaches the working plane.

Various attempts have been made to solve the problem and there are a considerable number of installations in which indirect illumination is applied in different ways, the most successful heretofore being that in which the light is hidden behind brackets, or cornices around the edge of, and the light reflected toward the ceiling of the room.

Another method which produces very pleasing effects is that in which the light is reflected through art glass in the ceilings of the room.

These methods produce very good results and wherever expense is not to be considered, they will undoubtedly grow more and more in favor.

Recent developments have been made that probably mark an epoch in interior illumination. Indirect illumination is now made commercially available; it is brought within the reach of the person of ordinary means.

In this system valuable suggestions by members of the Illuminating Engineering Society were followed out, as also those by members of the Ophthalmological

Society, who are so emphatic in the assertion that most eye troubles are caused by the present method of artificial illumination in which the delicate mechanisms and nerves of the eye are subject to the

direct rays of the intensely brilliant modern lighting units.

The successful solving of this problem and its practical working out depended upon two things:

First, a light of high candle power at low cost.

Second, a reflecting surface that would give the first reflection of light upward without material loss.

Where gas is used the necessary candle power and economy is found in using the higher grade incandescent mantel burners.

Where electricity is used, the high efficiency of the Tungsten lamp proves an ideal source of light for this indirect lighting system. The intense brilliancy of this lamp makes inadvisable its use in small rooms on ordinary chandeliers because of the blinding effect.

The reflectors used consist of a single piece of blown glass, coated on the outside with pure silver, giving a reflection of remarkably high efficiency. The silvering is protected on the outside by coats of elastic enamel. It is important that the reflector be capable of being molded so as to be uniform and correct in design and compact in form, and to permit of easy and thorough cleaning.

The design or shape of the reflector also has an important bearing on the efficiency and on the effect produced in the room.

The correct shape of this inverted reflector for throwing the rays of light to the ceiling without shadows, as adopted, has been the result of considerable calculation and experiment.

The perfected design is of a bell shape and contains peculiar circular and vertical corrugations. Being fire glazed, the exposed glass surface is easily cleaned with a soft cloth.

The indirect lighting units worked out consists of this scientifically correct bell shaped mirror corrugated reflector, fitting in a spun brass casing. On gas fixtures this spun brass spinning rests on the base of the mantel like a globe. On electric fixtures this spun brass casing can either be suspended by chains or supported from below, as is the case of gas fixtures.

It is evident that an infinite variety of ornamental designs can be worked out embodying these units and from the great interest shown, fixture manufacturers in the near future will be designing fixtures for use with this method of illumination.

These lighting units can easily be installed on gas or electric chandeliers already in use.

The lighting units should be at or near the center of the room, though side lights can and have been used with satisfactory results. Light colored walls are not essential as most of the light is directed to the ceiling.

The rays of light striking first the diffuse reflecting surface of the ceiling lose their injurious effect on the eye.

Up-to-Date Plumbing Systems.

The subject of sanitation is receiving more attention today than at any previous time in the history of architecture. The increased size of living rooms, the provisions made for ample light and air, and the introduction of ventilation in connection with the heating system have done much; but more particularly there has been a wonderful improvement in plumbing, both in regard to the drainage system and to the water supply.

Improvement in workmanship, materials and installation have so changed the character of plumbing that new standards of comparison are required to determine the quality of work.

Estimating Air Space for Heating.

The problem of furnace heating and ventilating is a fascinating study, and the more we indulge in this study the more interesting it becomes.

The basic or underlying principle that governs the experienced furnace man is a strict adherence to the rules entering into the problem, and if his conclusions are reached by those rules on a logical basis, instead of the use of "thumb rules,"

failure and condemnation will be replaced by success and commendation, and the agreeable outcome of success and commendation is increased business and larger profits.

One of the first rules a furnace man should learn is that of determining the amount of cubic feet of air space to be heated, and in this calculation it is necessary to take into consideration the relation of exposed walls and exposed glass surface to the room or building to be heated. Some consideration, too, must be given to the relation of an adjoining unoccupied property; the loss of heat by transmission in this party wall must be overcome by a proportionate allowance in the total equivalent cubic feet or in the capacity of the furnace, for extra firing when that feature becomes necessary.

A simple rule for determining the equivalent cubic feet is: To the cubic feet in each room add for wall and glass exposure as follows (one-tenth of each square foot of wall exposure being equal in cooling effect to 75 cubic feet, and one square foot of glass exposure being equal in cooling effect to 75 cubic feet):

First, obtain the cubic feet by multiplying the length by the width of the room and by multiplying this result by the clear height of the ceiling.

Then multiply 10 per cent of the net wall exposure by 75 and add this amount to the total.

Then multiply the glass exposure by 75 and add this amount to the total cubic feet, and the cubic feet, the multiplied 10 per cent of the net wall exposure, and the multiplied glass exposure will constitute what may be called equivalent cubic feet; that is to say, the total will be equal to the cubic feet to be considered in determining the size of the furnace, the size of the warm air pipes and the size of the registers that will be required to heat the house.

Not a Plumber Born.

Pipes & Fassit ran a busy shop. They had men out, working the eight-hour day, in the Washington Heights district. They had helpers out, too, at the regular rates.

Monday morning had opened up with a rush. Joints were bursting and bathtubs were flowing over.

Fassit generally followed up the jobs, seeing that they were covered. Pipes held the desk down and made out the bills.

Presently the door pushed open and a hardy looking young fellow came in. He handed a note to Mr. Pipes. Pipes read it.

"Please sir—" said the young fellow.

"Don't 'please' anybody here," said Pipes. "Riley says you're a good man and willing to work. Siddown!"

The hardy looking young fellow sat for five minutes. Then the telephone bell rang.

"Get that off the wire," said Pipes. The young man got it.

"It's Mr. Silverberg that owns the big apartment house on St. Nicholas avenue. His star tenant complains of a leak in the ceiling from the floor overhead."

"You take that wrench and go over," said Pipes. "Locate the floor. Get around to Condon's, where we've got a contract, and lift a helper. Go back and find the leak. Report to me. Don't hurry too much."

The young man departed, returning in a couple of hours.

"Nothing doing, Mr. Pipes," he said. "The tenant overhead spilled some water in a corner of the kitchen. It ran under the sink and followed the pipe line to the floor below. That was all."

Pipes kept on making out bills. A ninety-cent clock got along to 12 just as the noon whistle blew outside.

Then Pipes rose up sadly.

"Here's sitting time," he said. "Take the money—you'll need it. A tenant imagines a leak. The owner wants to pay for repairing the leak. You were sent to find it. You failed. Some day you may be an angel, but you will never be a plumber. Good-by!"—National Contractor and Builder.

Prismatic Lighting.

By George E. Androvette, Lucical Engineer.

Prismatic lighting has become an important factor in modern buildings. The more intelligent public appreciate the value of natural light. The congested conditions involved in cities exclude the natural light, which in most cases can be restored by the use of various forms of prismatic glass, which changes the direction of light from vertical to horizontal lines and illuminates interiors previously dark unless lighted by artificial lights, which, aside from expense, are not equal to natural light.

There are several forms of prismatic lighting—window prisms, extension skylights, prism canopies, and sidewalk lights. Each method involves the use of glass having prism forms calculated to operate under a given condition, for the reason that the limitations of natural laws of light must be considered and either refraction or reflection must be used.

The writer has had twenty years' experience exploiting the possibilities of this work, and any person can command his services, free of charge, to explain and suggest the most effective methods.

Exterior conditions govern the methods to be employed, and success depends on intelligent installation.

Big Building for Burnham.

D. H. Burnham & Co. have been selected to build the National Bank at Spokane, on which is to be expended the sum of $1,000,000. When President J. W. Toohey of the old National Bank decided to build he issued invitations to every architect in the United States to enter into a competition offering $1000 to each architect who would compete.

As the Burnham company never engages in any competition, it declined to present any plans.

President Toohey was not pleased with the plans sent for his approval, and thought the best thing for him to do was to make a tour of the country and inspect the bank buildings.

He visited all large banks in New York, Chicago, St. Louis, Philadelphia and Baltimore, and finally came to San Francisco.

When he saw the First National Bank building he exclaimed: "Who built that bank building?"

"D. H. Burnham & Co.," was the answer.

"Ha! That is the firm which would not compete."

He went to his hotel and wired D. H. Burnham to go ahead with the plans for his new bank at Spokane.

"Certainly, we will build it," said Willis Polk, "and I think we shall be able to please him. As we never build two buildings alike, Mr. Toohey will have a structure which will be unlike anything now standing."

Dickey & Reed, Architects.

Mr. Charles W. Dickey and Mr. Walter D. Reed wish to announce that hereafter the firm name will be Dickey & Reed, architects. Their offices are in the Balboa building, San Francisco, and Oakland Bank of Savings building, Oakland.

By the Way

Some Industrial Information Worth the While

Changes Name.

The Kruttschnitt Building Material Company has been granted a change of name, and the concern will hereafter be known as the California Building Material Company. Manager Wood writes: "We desire to make this change (which does not affect our former management or policies in the least) incidental with the taking up and handling of new lines of high-grade building materials. We also take this occasion to thank our many customers for their patronage in the past, and trust that we may be favored with a continuance of the same in the future."

The California Building Material Company has the exclusive handling of the famous Niles sand and gravel, which have been pronounced by experts superior to many other deposits for reinforced concrete.

Russell & Erwin Move to New Quarters.

The Russell & Erwin Manufacturing Company has moved its Pacific Coast headquarters from the Monadnock building to the new Commercial building, San Francisco. The new quarters have been very handsomely fitted up, and in addition to a suite of fine offices for Manager Voorhees and his assistants there are a sample room and commodious storeroom. No house on the Coast carries a more complete line of building hardware, and samples of all the latest designs are kept in convenient form for architects and prospective builders. Russell & Erwin hardware is the hardware most used on the Pacific Coast.



TULARE HIGH SCHOOL—E. Mathewson, Architect

Library Bureau's New Home.

The Library Bureau of San Francisco is now located in its new quarters at 509-513 Market street. The bureau has leased the entire ground floor and has the benefit of an attractive store front which permits of a tasty display of stock. The bureau was formerly located on Mission street. The new store is more central and better adapted to the needs of a constantly increasing business. The bureau carries one of the most complete stocks of library equipment and office paraphernalia, filing devices, etc., in San Francisco, and architects, engineers and builders should not fail to inspect the same before giving their orders.

Attractive Interiors.

Pfister & Co., artist decorators, announce that they are prepared to assist architects and owners in attractive home decoration. Mr. Pfister is an artist of recognized ability and he has associated with him a staff of competent assistants. Bare walls and ceilings are transformed into rooms of attractive beauty, at moderate cost. Landscape, marine, flower and figural paintings are executed in effective style and finish. The studio is at 169 Grove street, San Francisco.

San Jose Normal School Contract.

The F. A. Engstrum Company will build the new normal school at San Jose. The building will be Mission style and of reinforced concrete. Construction work already has been started, and the contractor hopes to complete the building in 150 working days. The other companies bidding on the work were the Ransome Concrete Company, Thompson-Starrett Company and Rickon-Ehrhardt Company. The latter has received the contract for building the power house in connection with the new normal school building.

Modern Church Architecture.

Plunging into the controversy that ever centers about the question of the modern church building, J. Stewart Barney, who designed the celebrated Broadway Tabernacle, New York city, contributes an important paper on "The Modern Church Building—What Should It Be?" to the May issue of Munsey's Magazine.

Mr. Barney takes keen pleasure in dissecting the comment of various critics of church architecture, and quoting several particularly severe tirades against the present-day church building, he says:

"Hysteria in art is more dangerous than ignorance, though less criminal than chicanery. In the amateur, if well developed, it is incurable. In the professional it takes the form of business policy, which he changes to suit the fashion.

"It is generally seen in its most acute stage in the writers of hysterical articles on the subject of art and architecture."

Replying to the plea of other critics, that architects embody in a church edifice a suggestion of the nature of the congregation within, Mr. Barney continues:

"Would it be proper to build in New York, on a limited piece of land, a New England meeting house, which would be rendered ridiculous by the surrounding skyscrapers, in order to express to the 'puzzled wayfarer' that this was the home of a New England Congregational church?

"The most beautiful buildings of the past are those which most nearly suit their requirements. Should we, in designing an automobile, follow the lines of the Roman chariot, the sedan-chair, or the stage coach?"

Mr. Barney's article is profusely illustrated, and will undoubtedly awaken no little discussion in architectural circles by reason of its frank and fearless handling of a subject of wide difference of opinion.



Interior View of Fred W. Wagner's Store, Portland, Ore.

Wall and Floor Tiling

Architects, builders and owners who are interested in the use of sanitary wall and floor tiling will do well to visit the fine store of Fred W. Wagner, 363 Stark street, Portland, Oregon, where will be found one of the largest and most complete show rooms in the Northwest. Mr. Wagner is a veteran in the tile business, having learned the trade in New York city. The following contracts are a few out of hundreds Mr. Wagner has filled the past five years in Portland: Corbett building, Board of Trade, Danmoore hotel, Nortonia hotel, Wallace hotel, Wallace, Idaho, 8,000 feet; Worcester block; Couch building, completing seven floors in five days; United States National bank; mosaic floors for Dr. Coffey's office, pronounced the handsomest west of Chicago; T. B. Wilcox residence; also residences of Harry Corbett, Allen Lewis and Messrs. Van Nesse, Montgomery, Honeyman, Ainsworth, Creighton, Wells and Lawrence.

Honeymooners to Be Given Great Show.

"Every one loves a lover." That is probably why Niagara Falls, the Mecca of all honeymooners and no small number of "prospects" in this line, is to be lighted up by the biggest searchlight ever made. The proposed illumination is thus described by the Buffalo News:

"It is planned to illuminate the falls along the lines originally laid down by W. d'Arcy Ryan, illuminating expert of the General Electric Company. This means the expenditure of between $125,000 and $150,000 and the installation of the most powerful aggregation of electric projectors ever assembled. The illumination of the falls in 1907 created world-wide interest, but the spectacle this year will far eclipse the first attempt. Rays of light of more than 2,000,000,000 candle-power strength will be shot upon the face of the falls, and the aurora of the combined batteries will be visible as far away as Toronto. Sixty-inch projectors will be used, and the spectacle will be a permanent summer feature."



Steel Lockers.

With the erection of so many club and church buildings in San Francisco and vicinity has come a demand for high-grade sanitary lockers, which are an indispensable adjunct to the modern gymnasium equipment. Of course, no first-class club building would be without its "gym," while many of the churches have found that a boy's gymnasium constructed in the basement of the edifice keeps the lads off the street, and makes an attractive playground for them. A number of Y. M. C. A. buildings under construction or about to be commenced have also increased the demand for lockers and gymnasium paraphernalia.

There is probably no company in the United States which manufactures a higher grade steel fixture than the Federal Steel Fixture Company of Chicago and which has been fortunate in securing Mr. J. A. O'Reilly as its California representative. Mr. O'Reilly is best known in San Francisco as the "lime man." He has offices in the Williams building at Third and Mission streets, and is probably one of the best posted men in the building line in San Francisco to-day.

The illustration above shows one of the new design clothing lockers made by the Federal Company. It is built on the very finest steel furniture lines.

This company has specialized on lockers and manufactures a wide range of sizes and styles, including both the sheet steel and expanded metal types.

The Federal Patented Locking device, adjustable feet and unit system construction are noteworthy features.

Ask for complete catalogue of steel lockers.

A New Surfacer for Concrete and Brick Walls.

Architects and contractors who have sought in vain a preparation that would serve the double purpose of a damp-proofing compound and exterior finishing material for rough brick and concrete, will be gratified to learn that a mixture has at last been prepared that answers the above requirements. "Tectine" is the name of the paste, and the Reliance Damp Proofing Company, 250 Monadnock building, San Francisco, are the manufacturers and sales agents. Practical men, thoroughly familiar with cement, concrete work and brick, are interested in the company, and they have carried on a series of severe tests which have demonstrated to their complete satisfaction th superior merits of the material.

In applying the paste the walls are thoroughly prepared in advance. In reinforced concrete walls, for instance, all protruding wires and steel are hammered in and well coated to insure absolute protection from rust and also to insure a non-conductor of water or dampness. Any defects on the surface are filled in so there will be no pores or cracks to prevent a smooth surface when the first coat is applied. The preparation, which is in the form of a paste, contains no oil or fatty substances that would clash with the alkali, being made of mineral substances that harden quickly and become firmly fixed to the wall. "Tectine" has been used on a number of buildings in California, which the company would be pleased to point out to architects and others interested.

Bids on Electrical Work.

The San Francisco branch of the National Electrical Contractors' Association has sent out the following notice to architects, contractors and builders:

"From and after May 1, 1909, bids or estimates from members of the undersigned association, on electrical work or installation, will not include cost of any service outside of exterior walls of building or structure on or within which work is to be done or installation made, or cost of fees to any public service corporation, or cost of mechanical door openers, or cost of wooden doors or 'trim' on electrical cabinets.'"

An Important Commission.

Architect Octavius Morgan of Los Angeles has received the following communication from Mr. Glenn Brown, secretary of the American Institute of Architects, Washington, D. C.:

"Mr. Octavius Morgan, 232 North Main street, Los Angeles, Cal.—Dear Sir: Mr. Cass Gilbert, president of the American Institute of Architects, has appointed you a member of the committee on government architecture, to serve one year. Be kind enough to notify me of your acceptance of the position. Very truly yours,

"GLENN BROWN, Sec'y."

The committee, as a rule, is selected from the ranks of the most prominent architects of the United States, and the present one is no exception. It is formed for the purpose of acting on matters pertaining to government architecture, and is considered quite a compliment by those fortunate enough to receive recognition. The full committee consists of J. Rush Marshall, William Rutherford Mead, Charles S. Frost, Thomas C. Young, Robert S. Peabody, John M. Donaldson, S. B. P. Trowbridge, Albert Pissis, George Cary, William Holabird, Harry Leslie Walker and Octavius Morgan.

Successful San Mateo Plumbing House

One of the most successful plumbing houses in San Mateo county is that maintained by J. P. Ahlert of Menlo Park. Many of the finest residences in San Mateo county have been equipped with heating and plumbing fixtures by Mr. Ahlert. He has been a master plumber in San Mateo county for twenty-four years, and all that time, barring about a year and a half when he lived in San Mateo, he has resided at Menlo.

Mr. Ahlert enjoyed the distinction of plumbing the old Haywards residence at San Mateo, now the Peninsula Hotel, when that famous home was first built. Mr. Ahlert has done all the plumbing in the St. Patrick's seminary at Menlo Park since the earthquake. He has just completed a fine plumbing and heating job in the new Infirmary building of St. Patrick's seminary, designed by Architects Shea and Lofquist, and illustrated elsewhere in this number of the Architect and Engineer. The fixtures installed in this building were from the J. L. Mott Iron Works, and the hot water heating apparatus was supplied through the American Radiator Company. Mr. Ahlert also built the gas plant at the seminary. It has a capacity of 600 lights and has given excellent satisfaction since its installation. Some years ago he built a gas plant for the chemical laboratory at Stanford University. One of the best jobs of residence work done by Mr. Ahlert was the plumbing of Mr. J. A. Donohoe's home at Menlo Park.

Lamson Mechanical Messengers.

The Lamson Consolidated Store Service Company, which has its Pacific Coast headquarters in the Call building, San Francisco, has installed various features of its service in many of the leading San Francisco stores. The Lamson Company makes all kinds of mechanical messengers for cash and other purposes, some being operated by means of electric power and others by the pneumatic system. The big department stores are enthusiastic in praising the Lamson parcel system, which allows the merchant to check out his goods and increases business by giving the salespeople all their time for their legitimate work of selling.

Change in State Architect's Office.

George C. Sellon, a member of the firm of Sellon & Hemmings, has resigned his position as California State Architect. The office pays $4800 a year, but by a recent act of the Legislature the incumbent is not allowed to carry on any private practice. Mr. Sellon will continue his association with Mr. Hemmings for the general practice of architecture, with offices in San Francisco and Sacramento.

On May 5th Engineer Ellery appointed William Coates to succeed Mr. Sellon. Mr. Coates was formerly in the office

of Architect Frederick Meyer and later he was engaged in State work for Mr Sellon. He received a certificate to practice architecture about a year ago.

Prosperity Ahead!

R. H. Pease, president of the Goodyear Rubber Company's San Francisco and Portland stores, is back from a six-week's Eastern trip, and is enthusiastic over the business outlook. He declared that trade conditions are improving right along, the banks are loaning liberally and money is easier than it has been for some time. Any one with good credit has no difficulty getting all the cash he wants. There is considerable building going on in the large Eastern cities, and business in general is picking up. Mr. Pease says people are still marveling at San Francisco's pluck and enterprise. Many feel that a settlement of the tariff question is all that is now needed to restore complete confidence and good times. The Goodyear factories are running on full time, in fact, business is better with the Goodyear Company now than it has been for two years past. Mr. Pease believes California and the Pacific Coast will enjoy its full share of the prosperity wave now close at hand.

Watson Roof Company Busy.

The Watson Roof Company is covering the attic and filing-room floors of the new United States Custom House in San Francisco with their "Watsonite" Floor, about 26,200 feet in all.

Twelve floors, attic and basement of the new David Hewes building, Sixth and Market streets, are also being floored by this company with their "Watsonite," calling for approximately 47,000 square feet of work.

"Watsonite" is being specified for the manual training and domestic science rooms in the new school houses at Reno, Nevada, George A. Ferris & Co., architects, and is being specified also for many of the new San Francisco schools being planned and erected.

A Correction.

The fine new Young Men's Christian Association building in Portland was heated and ventilated by the W. G. McPherson Company, and not by Cox & Vengelen, as stated in the April Architect and Engineer. The plant was not only installed, but was designed by the McPherson Company. Other creditable work done by the W. G. McPherson Company includes the Corbett building, the Board of Trade building and the Couch building. Contracts are being carried out for heating the Lewis building, the Kiernan building and several other large buildings in Portland.

An Index to the Advertisements

[Index continued on Page 108.]

Colored Glass.

The Improved Colored Glass and Sign Company, E. Marzolf, proprietor, of 107-111 Tenth street, near Mission, San Francisco, is turning out some attractive and artistic colored glass work, which may be seen in a number of San Francisco buildings where there are restaurants, cafes or saloons. The firm specializes in ornamental glass doors and windows, which not only add to the appearance of the building from an artistic standpoint, but serves as an advertisement for the owner, customers being attracted to the place by the picturesqueness of the exterior. Ordinary windows, transoms, doors, halls, bathrooms, bedrooms, etc., may be decorated at a reasonable price. The company claims its colored glass is an excellent substitute of genuine stained glass, in fact, is equal in design and beauty to the finest art glass made. It recommends itself both for sanitary reasons and convenience. It saves all window, and curtain washing and excludes flies and other insects. The color preparation is easy to apply and when treated according to directions, will last any length of time.

The Rapid Floor Surfacer.

The Inlaid Floor Company of San Francisco is meeting with excellent success in handling the Schlueter rapid floor surfacer, and a number of the machines have been placed in operation in San Francisco and neighboring towns. The surfacers are especially intended for smoothing both hard and soft wood floors in schools, public and office buildings, factories, skating rinks, dance halls, etc. The machines will even up all rough joints and warped edges, will remove old varnish, shellac, oil, wax, lime stains, etc. The machines have been used with great success in the Golden Gate Grammar School, Levinson's department store, the White House and the American Hotel, in San Francisco.

Test of Chemical Engine.

The Oakland Tribune published the following report of a test of the new Kanawha chemical engine recently purchased by the town of Fruitvale:

"The new Kanawha chemical combination hose wagon was tested at a fire recently before Fire Commissioners E. L. Blackman, J. W. Bibby, Phil Blake Jr., Fire Chief A. K. Jacobson and a large crowd of spectators. A light frame building was constructed for the purpose on the Derby property on Fruitvale avenue, saturated with coal oil and set afire. The alarm was rung and in just two minutes the engine was on the scene of the conflagration.

"Flames from the wooden building were shooting skyward twenty-five feet high when the engine arrived on the scene. Engineer Ballestren turned on the "juice" and Chief Jacobson rushed into the heart of the burning structure with the hose. Within thirty seconds of the first application the fire was completely extinguished, demonstrating to the satisfaction of all present that Fruitvale has one of the most up-to-date of fire engines. The engine cost the commissioners $1550. It carries 1000 feet of hose and has a capacity of fifty gallons of chemical. It is operated by compressed air."

The L. E. Boyle Company is the Western representative of the Kanawha Chemical Engine Manufacturing Company of Charleston, W. Va., builders of chemical engines for fire department use.

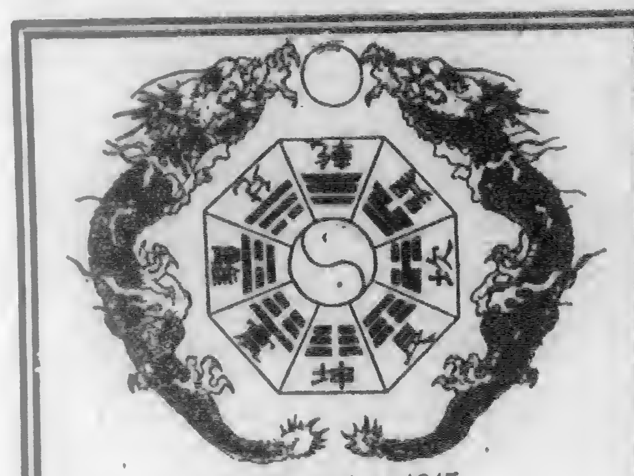
ADVERTISERS' INDEX—Continued from Page 105

Bond Election in June.

The San Francisco Board of Supervisors has passed to print an ordinance providing for submitting to the people at the special election in June the question of issuing $8,500,000 of bonds to cover the cost of acquiring lands and erecting a new City Hall at the suggested civic center at Van Ness avenue and Market street. With this project, it was agreed also to submit to the people the question of erecting a new polytechnic school and Juvenile Court building, and of acquiring park and playground property, the total of all the proposed expenditures being $10,864,000, as follows: Civic center and City Hall, $8,500,000; polytechnic high school, $600,000; juvenile detention home, $125,000; Potrero park, $750,000; Telegraph Hill park, $250,000; aquatic park, foot of Van Ness avenue, $350,000; Bay View park, $50,000; Glen park, $50,000; playground, block bounded by Noe, Sanchez, Elizabeth and Twenty-fourth streets, $165,000; block bounded by Iowa, Pennsylvania, Nineteenth and Twentieth streets, $15,000.

Mission Architecture for Federal Buildings.

Supervising Architect James Knox Taylor announces that the Spanish or Mission style of architecture, with its belfry towers, red tiles, patios and arcades, shall be adopted for the buildings to be erected for the Government at San Diego, Santa Barbara, Riverside and, in fact, wherever Southern California public buildings shall be erected. The first building to be designed under this rule will be one for Riverside. As soon as the title to the property on which it is to be built has been passed upon by the Government, work will commence on the plans.



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Painted St. Patrick's Seminary

All the interior and exterior painting of the St. Patrick's Seminary buildings, illustrated in this number of the Architect and Engineer, was done by E. J. Crane, of Menlo Park. The same contractor painted the James L. Flood mansion at Menlo, Senator Felton's house, and the residence of C. W. Smith, all of which are in San Mateo county. Mr. Crane has also done considerable painting at Stanford University.

Meurer Tin Plates.

Meurer Bros. call attention to their Meurer Genuine Tinned Iron Sheets, of which they carry a large stock, both IC and IX, in San Francisco, Los Angeles, Portland and Seattle.

"There is nothing that will equal a roof of good tin," writes their Pacific Coast manager, A. H. McDonald. "Our tinned iron sheets carry a coating of forty pounds of tin and lead to a box of 20x28 tin on a base of rehammered charcoal iron. It is coated by hand in old style open pots through palm oil; it is known as the old style method. It is the finest plate to be had and will last fifty years. We have sold this plate for twenty years and never had a complaint.

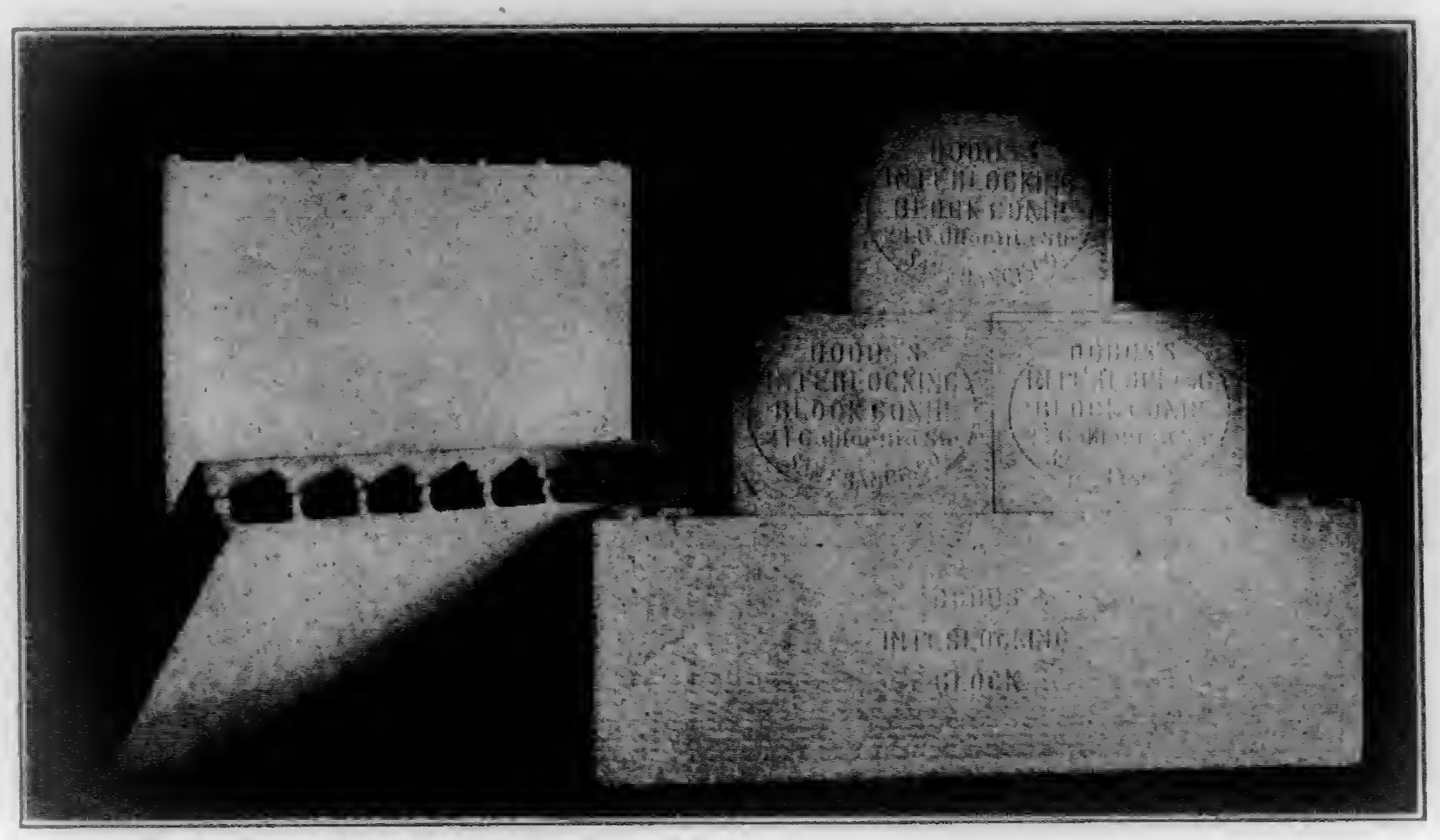
"We append a copy of analysis of Meurer Genuine Tinned Iron Sheets, made by Mr. John C. Sparks, F. S. C., a chemist of international reputation, a member of the American Chemical Society and of the Society of Chemical Industry, which analysis we have verified from time to time, to make sure that the plate we are selling to-day is the same as when we first introduced it:

Iron	90.841 per cent
Carbon	0.031 per cent
Silicon	0.162 per cent
Sulphur	0.005 per cent
Phosphorus	0.078 per cent
Manganese	0.041 per cent
Tin	2.120 per cent
Lead	6.722 per cent

"The foundation of this sheet of roofing tin is pure iron.

"If you want a roof to last a century, use Meurer Genuine Tinned Iron Sheets."

Cement continues to be the most interesting commodity in the supply line. Barely a scratch has been made in the records of the past, compared with the volume of consumption that is to come. The main and only trouble is that still the builder does not know how to use and apply cement to his needs so as to take up the ever growing production.



Samples of Finished Blocks Ready for Erection

THE Dodds Interlocking Plaster Partition Block is manufactured in San Francisco. The advantages of this block partition over metal lath and tile are very marked. The astonishing development in metal lath and tile in the past few years has been excelled by the introduction of Dodds' Interlocking Block Partition.

The blocks are manufactured in perfectly finished iron molds thoroughly true and square to insure a first-class uniform cast, which cannot be obtained with wooden molds.

Special interlocking door bucks are installed with all partitions, forming an extra strong-hold for door frames. Key blocks are inserted over door heads, forming a strong arch in case of woodwork being burned out.

The Dodds Company manufactures special cast blocks for furring around pipes, which are stronger and in every way superior to the present form of furring in metal lath and tile work. The metal lath in a period of three months or so corrodes and loses its key, as will be admitted by many who have recently paid for the experience. The tile cannot be cut so easily, requires double time in setting and also two coats to complete, compared with only one coat necessary to finish Dodds' block partitions.

The Dodds form of partition dispenses with reinforcing rods and forms a strong and perfectly straight, sanitary, soundproof and fireproof partition. It does not crack, stands hard usage and requires no wood grounds or blocks for fixing trim.

A large stock of standard size blocks, two and one-half and four inch, are carried in stock and will compete with wood stud and metal lath partitions.

The blocks are absolutely dry, thereby making a dry, hard finish at once.

The partition is especially suitable for subdivision of stores, offices and lofts and can be fixed and finished the same day.

The Dodds' Interlocking Block Partition has been erected in San Francisco buildings as follows: Drexler building, Dr. Merritt building, Emporium, White Garage, Hewes building, Marquis Hotel, Lurline Baths, etc. The company has erected a partition in the Schroth building Union Square, twenty feet high, of four-inch blocks, without any form of reinforcement, which is absolutely irresistible.

A sample block will be furnished upon request.

State University Improvements.

The following is a list of the buildings and improvements decided upon by the Regents of the California State University:

Agriculture Hall	$200 000
Addition to Chemistry Hall	200,000
Library equipment	200,000
Gateway and bridge	50,00
Purchase of Strawberry Canyon	200,000
Sinking fund for future buildings and improvements	10,000
Vault at Lick Observatory	10,000
New tunnels	15,000
Improving president's house	25,000
New heating apparatus	6,000
New lighting system	2,700
Total	$918,700

Expert Inspection of Materials.

Among the class A structures of the modern San Francisco none are more frequently referred to as models of thoroughly excellent work in every respect than the new United States custom house, the Alaska Commercial building, the First National Bank building and the Palace Hotel.

Of its kind, each of these magnificent structures is a markedly high-class example. Each is a specimen of the good design and careful construction one would naturally expect to find in the work of the eminent architects responsible for them.

The structural steel in all of these buildings was inspected and tested, both chemically and physically, during manufacture and before being sent to the fabricating shops for cutting and punching. This latter work was also carefully inspected and checked at the shops before shipment to San Francisco, so that possibility of defect of every sort was reduced to a minimum.

This testing and inspection work was performed by experts in the employ of the well-known firm of Robert W. Hunt & Co., upon whose services, for protection in the purchase of construction materials, so many of the most careful of the engineers and architects of this country now rely.

Among thoroughly cautious engineers there is no question of the necessity for this class of care and protection, for to know that the materials of construction are of the quality, form and quantity specified is fully as essential as to know that the designs and specifications themselves have been properly prepared.

Engineer Barker's Report

Assistant State Engineer, Ralph Barker, has made public his report in regard to the faultiness of the seawall of San Francisco. In part he says that the seawall has sunk from three to five feet in places and that big holes appear in streets where the surface is giving way to the action, and foundations are settling under heavy warehouses. The sinking portion of the wall cost $1,520,000 to build and probably a half million dollars will be required for repair work. The seawall in question extends from Mission to Jones street, and is known as section A, B, 1, 2, 3, 4, 5, 6, 7, and 8. Mr. Barker recommends that any new wall be built on a foundation of piles sunk into the mud instead of on a trench filled with rock. The Ferry building foundation rests upon piles driven as above mentioned, and Engineer Barker asserts that section 8a and 8b form a non-settling wall.

Veneering a Light Court With White Bright Glazed Wall Tiles.

By W. W. Funge, Jr.

It was recently found necessary to refinish the immense light court of the Pacific building in San Francisco on account of the original cement finish peeling off in places and also to do away with the sombreness of the dull gray surfaces. The original cement finish was removed and it is now being covered with Patent Grip Anchor Back wall tiles of bright white glaze 6" x 3", made by the American Encaustic Tiling Company, Ltd., of Zanesville, Ohio. These tiles are specially well suited for a job of this sort on account of their security against coming loose after once having been set, the anchors formed in the tiles in making, producing a perfect rivet head of cement at each corner of the tile.

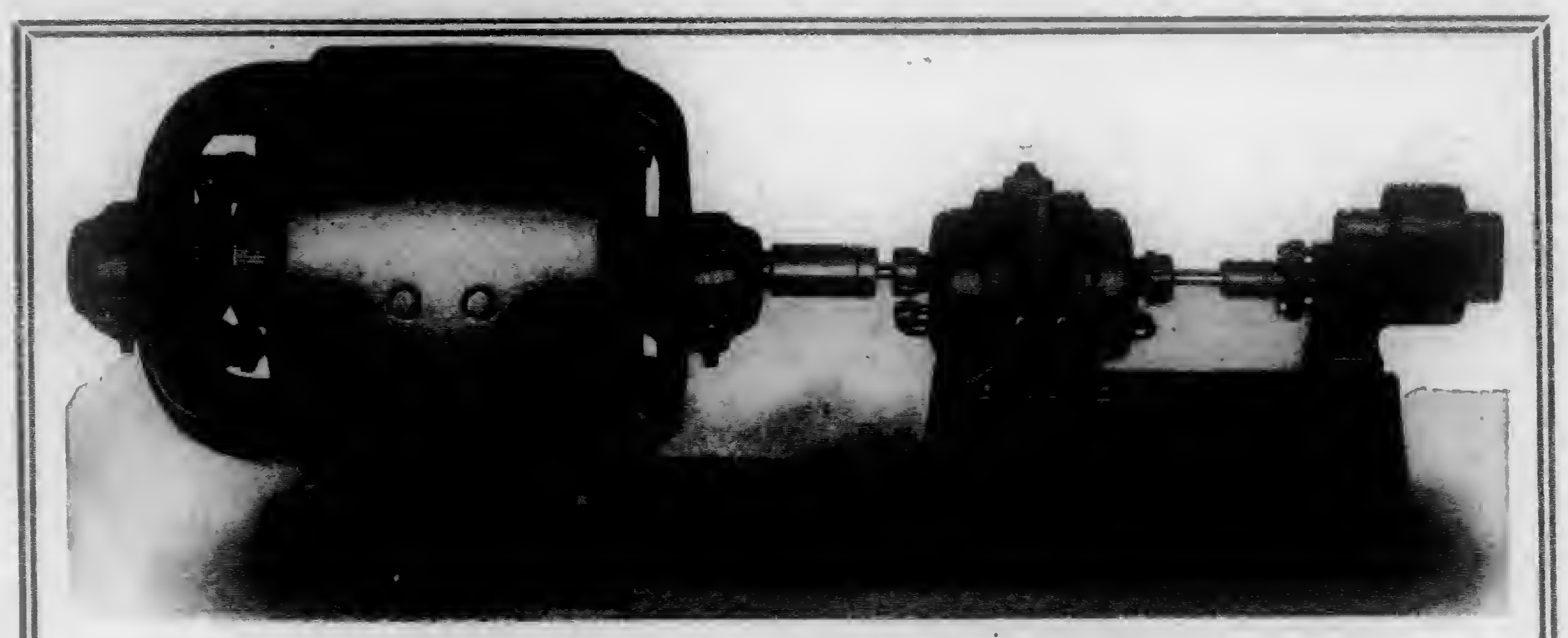
It was at first proposed to patch the spaces where the cement finish had loosened or peeled off, but in estimating the cost and the prospects of future retouching, as well as the difference in the appearance of the job when completed, it was found that it would be cheaper to veneer the walls with tile. The work alreadv completed shows that this was a wise decision, as the court is greatly enhanced in appearance and the added light to the offices with a north exposure is very great. The tile veneer will also overcome the difficulty experienced in heavy storms beating against the south exposure causing moisture to penetrate the lighter walls, as has been experienced in several instances in San Francisco. So-called water proofing wears off in time and must be renewed.

There were nearly 20,000 square feet of tile used in this light court, and it was supplied by Mangrum & Otter, Inc., from stock. It would seem that San Francisco dealers carry immense quantities of tile in stock to be able to supply such a quantity at a moment's notice.

Tiles are coming into great demand for building exteriors, and their use is not confined to this market alone, as a recent visitor to the City of Mexico observed several buildings veneered with glazed tile there, and a large structure was under construction during the winter, which was also being veneered with glazed tiles of about 3"x3" size.

Tiles are used to considerable extent in veneering exteriors in Australia and in the older countries like India, Asia and many parts of Europe, their use going back as far as building history.

Tiles really seem to be the material in which modern architecture will deal in very extensively, particularly for mural decorations for the reason of the economical and artistic results to which they lend themselves to an almost unlimited extent.





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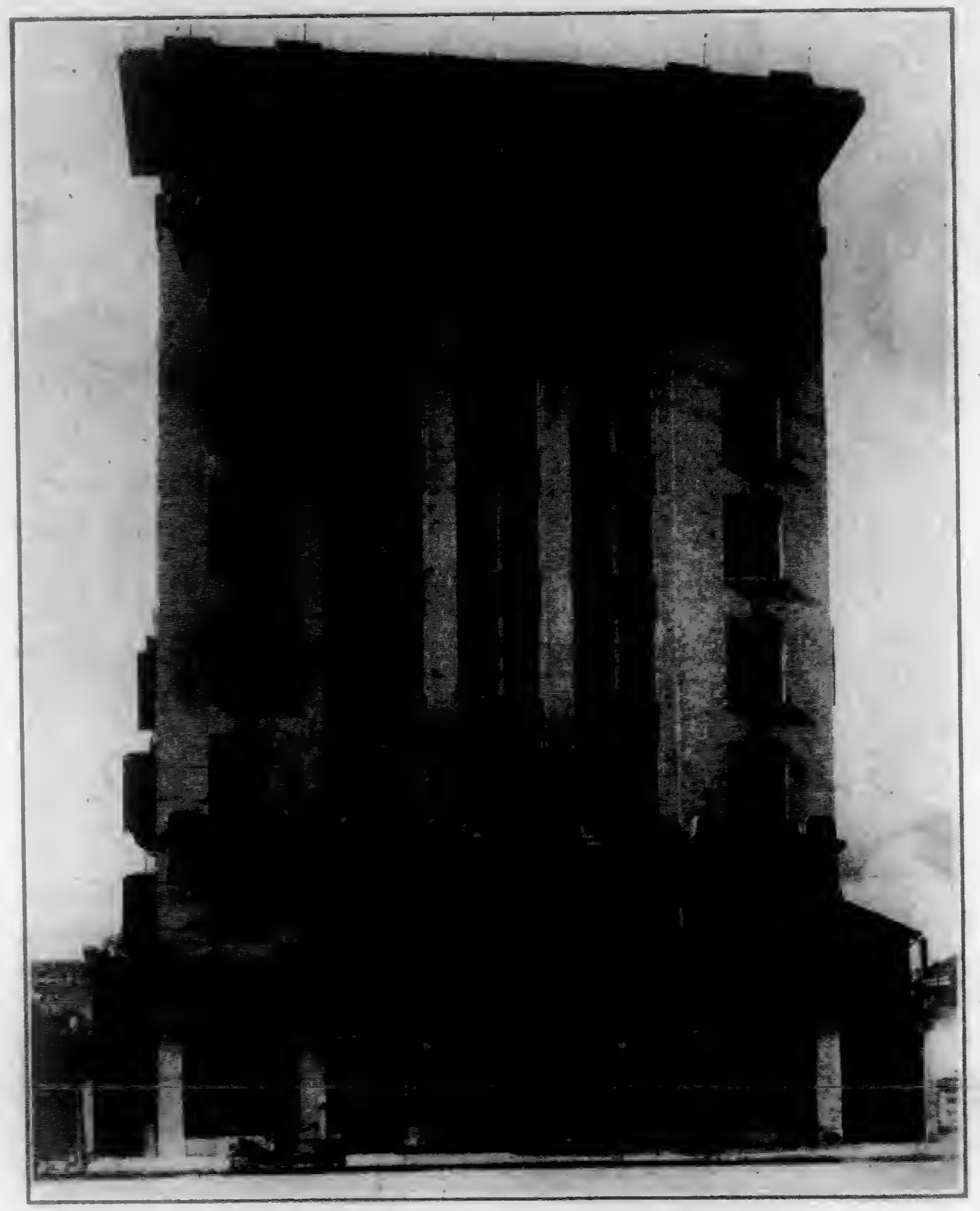
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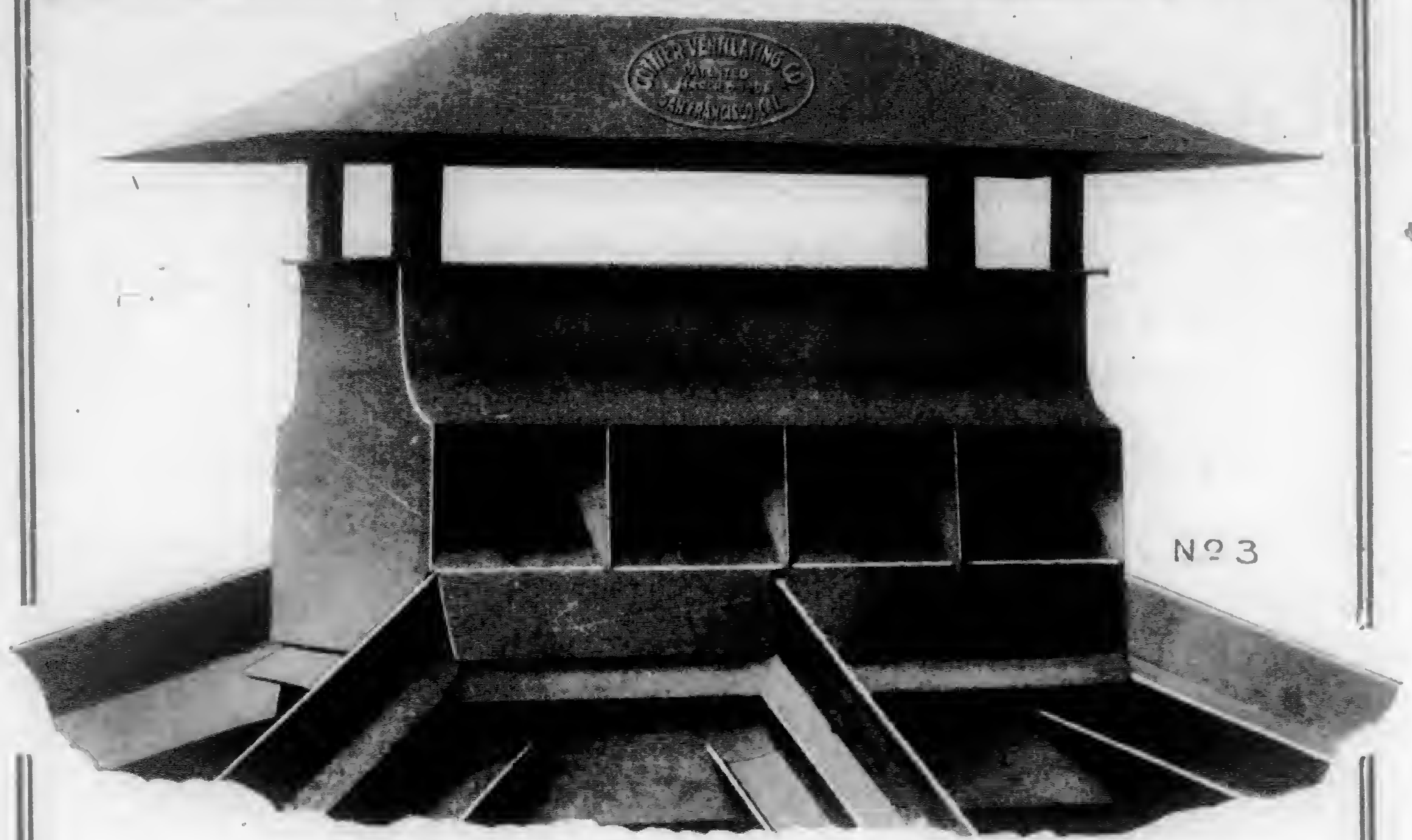
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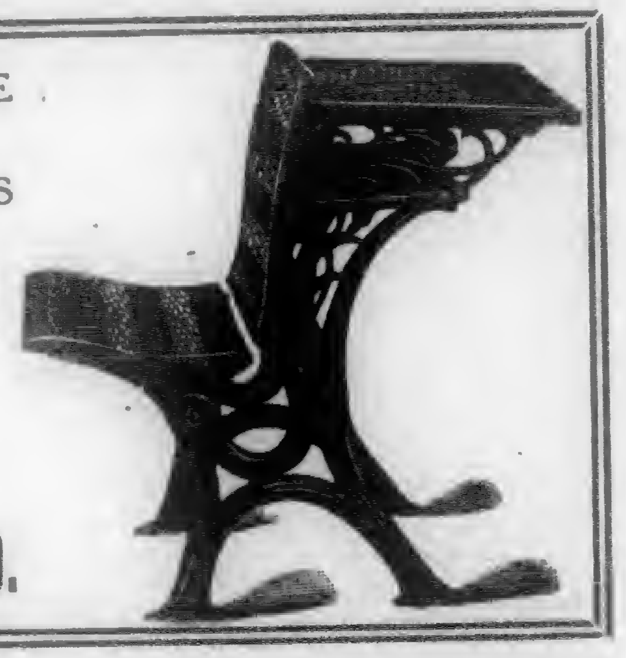
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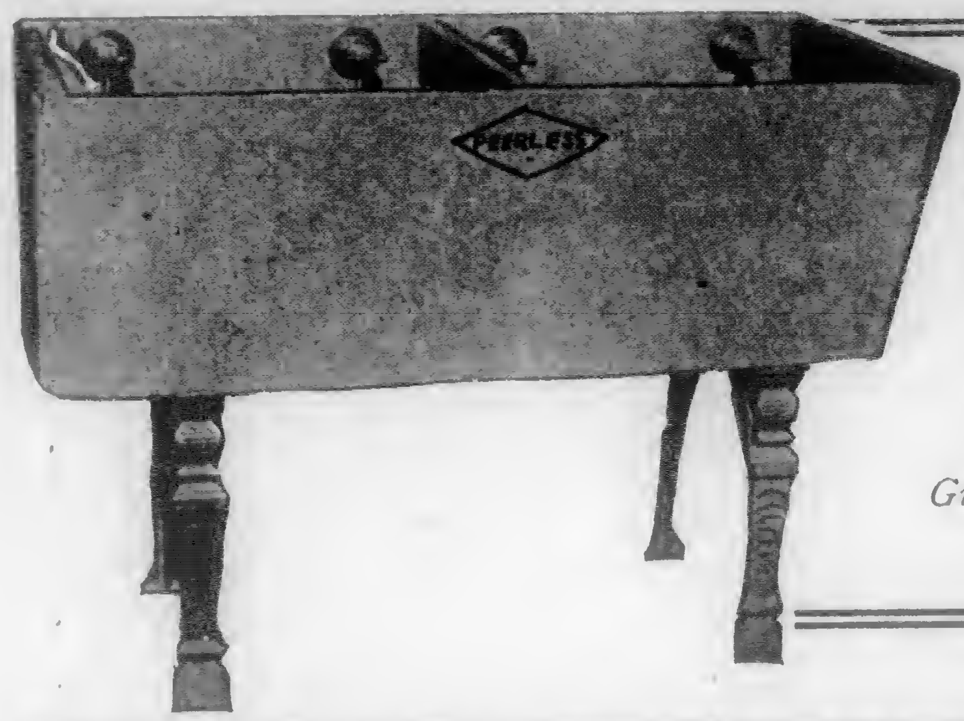
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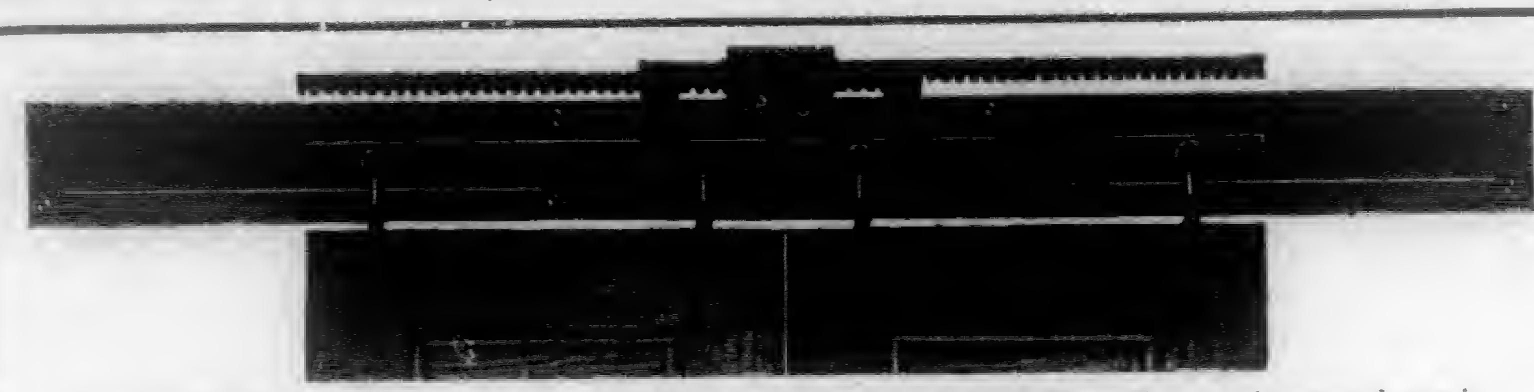
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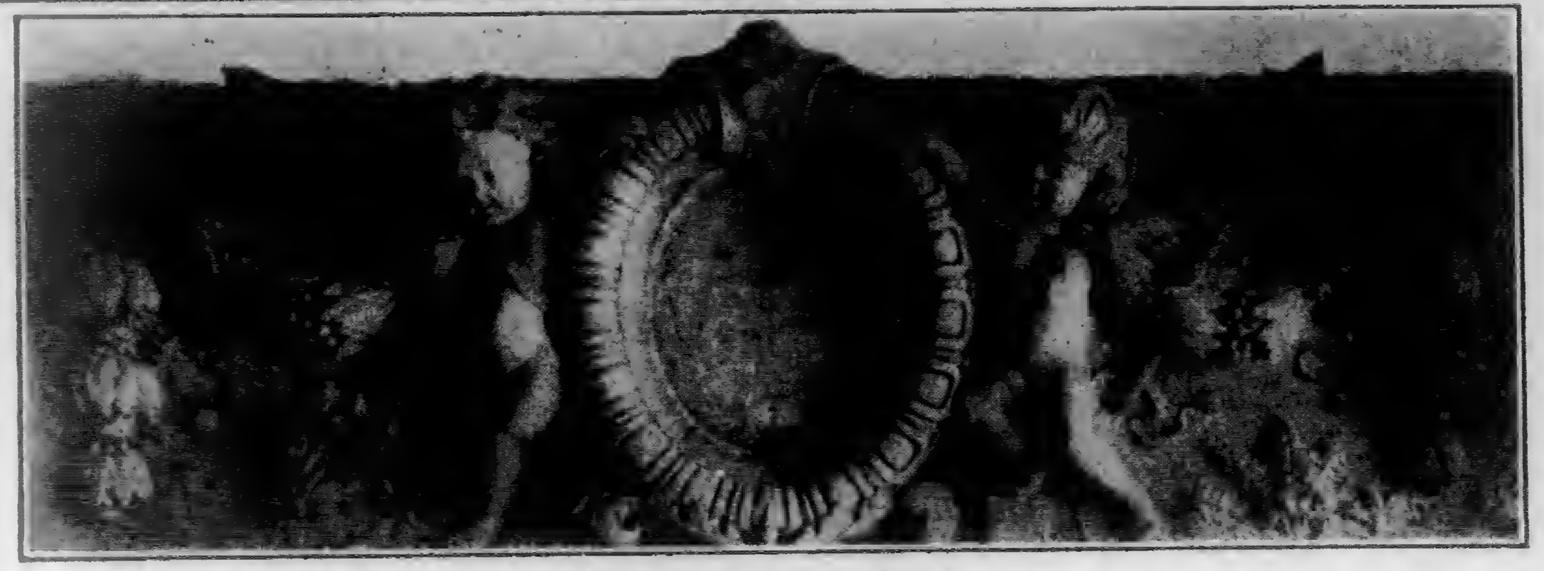
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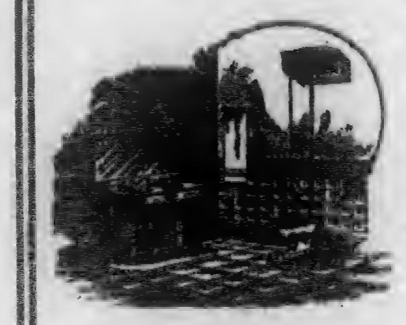
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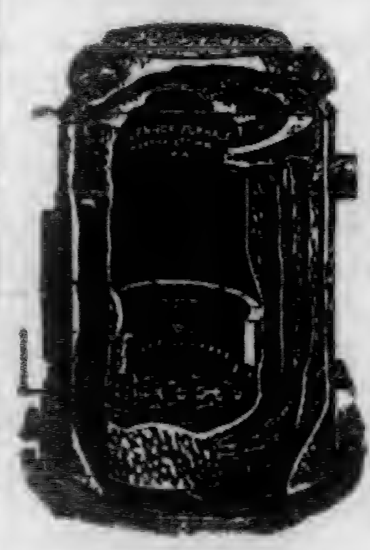
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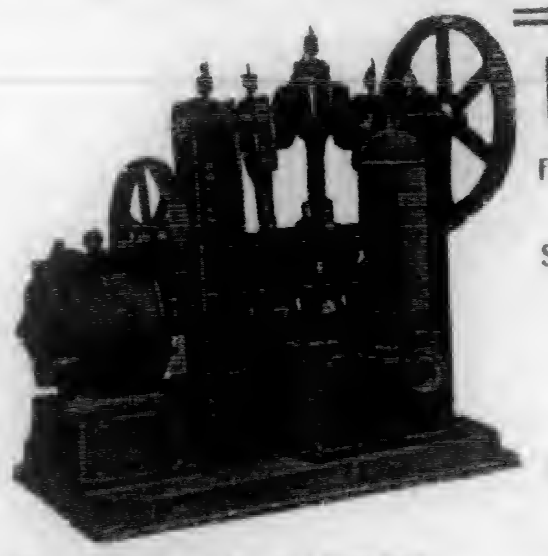
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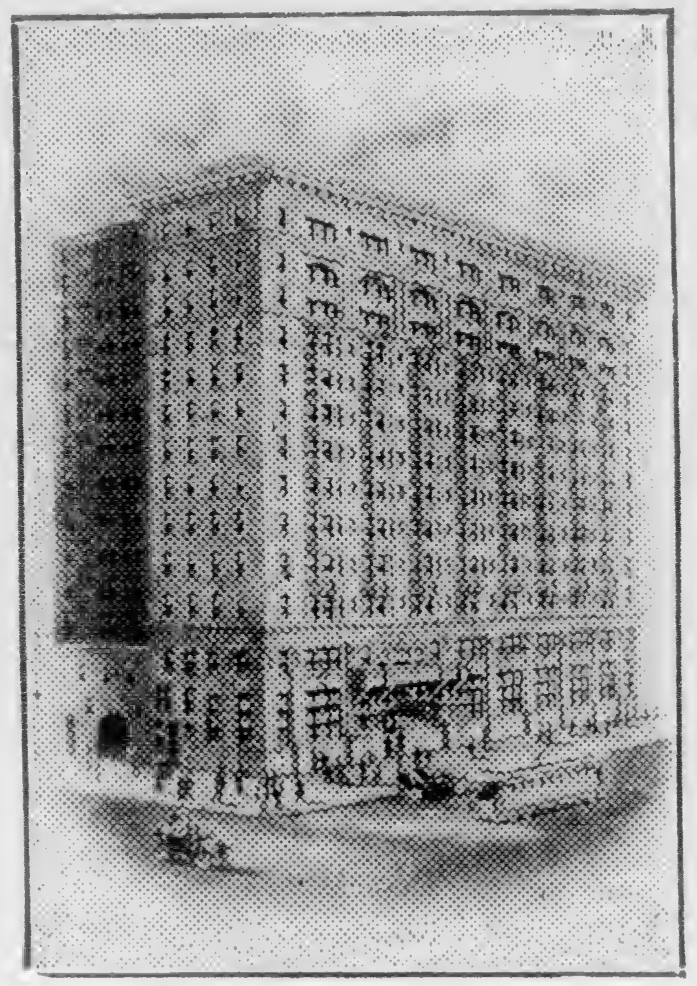
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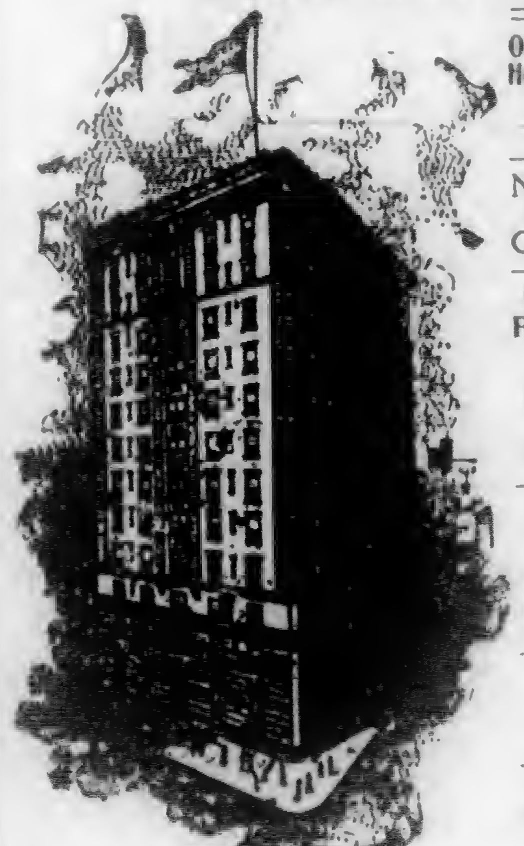
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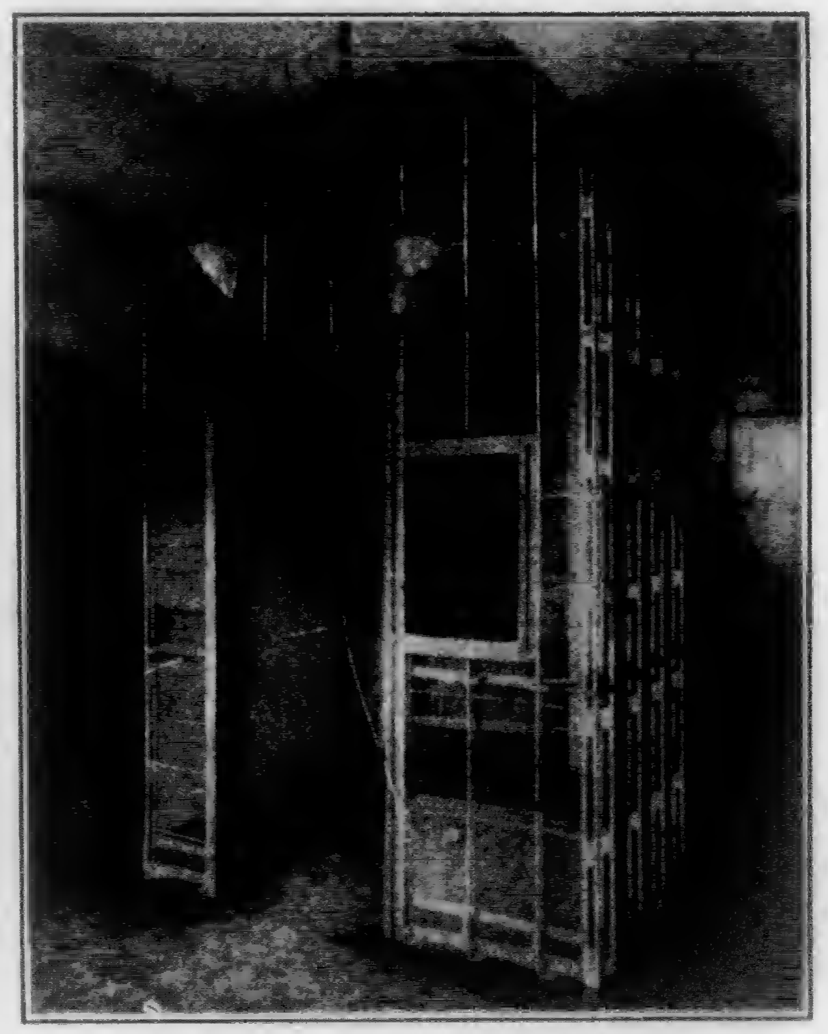
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NOTICE TO CONTRACTORS

Washington, D. C., U. S. A.,
May 8, 1909.

The Chinese Government, through its representatives, invites sealed proposals for the erection and completion of a group of buildings to be used as a Bureau of Engraving and Printing in Peking, China, in accordance with plans and specifications prepared by Architects Milburn, Heister & Co., Home Life Bldg., Washington, D. C. Said plans and specifications will be on file on and after May 15th at the following places:

Architects' Office, Washington, D. C.
Chinese Consulate, New York City.
Chinese Consulate, San Francisco, Cal.
Chinese Legation, London, England.
Chinese Legation, Berlin, Germany.
The Ta Ching Government Bank, Peking, Tientsin, Shanghai, Canton, China.

Bids from America and Europe must be filed with the Chinese Legation at Washington, D. C. on or before July 15, 1909. Contractors figuring on this work are requested to submit separate proposals for each or a part of the following main headings:

1. All buildings complete, including all excavation, concrete work, mill work, etc., required in connection with the mechanical plant.
2. All work as shown by the plans and specified under the head of Mechanical Plant.
3. All steel lockers, as shown and specified, press room busses shown on sheets Nos. 30 and 31, benches and tables specified for the fourth floor dining room, and tank in wetting room on second floor.

Contractors wanting to figure on the separate parts of the work are requested to file their bids at the same time and place as the bids for the work as a whole. Each proposal shall be in sealed envelope and marked plainly "Bid for work for Chinese Bureau of Engraving and Printing, Peking, China."

The successful contractors are given notice that they will be paid 80 per cent on the work as the same progresses, retaining 20 per cent until final completion and acceptance. Each contractor is given notice that he will be required to give a guarantee company's bond, payable to the Chinese Government, in sum of 50 per cent of the contract price, for the faithful performance of his part of the work, should his bid be accepted.

The Chinese Government reserves the right to reject any or all bids. All inquiries in reference to the work should be addressed to the Architects.

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Contents for June

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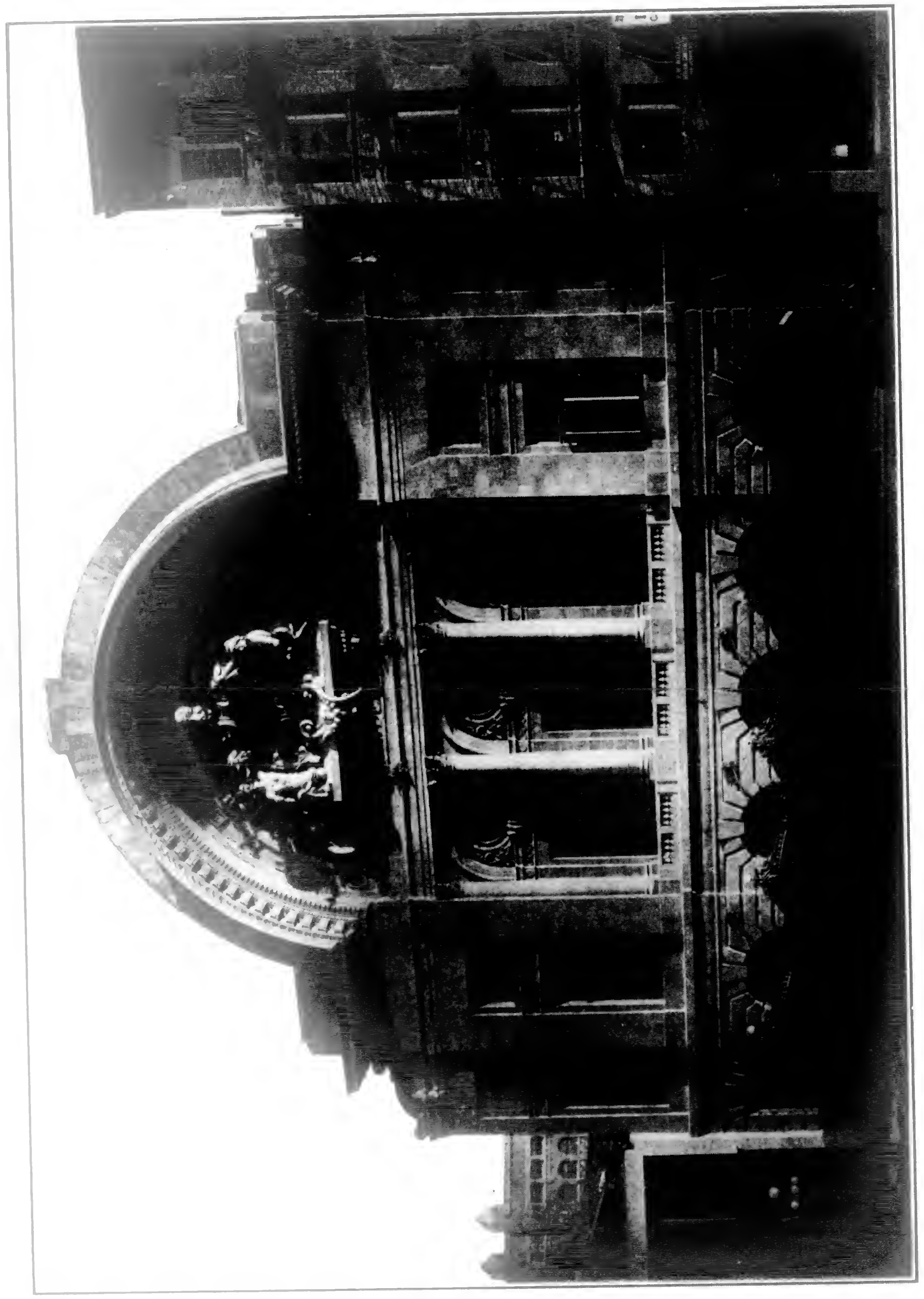
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Contents for June

(For Index to Advertisements See Page 100)



Frontispiece.
The Architect and Engineer of California
June, 1909

The New Orpheum Theater, San Francisco, Cal.
Lansburgh & Joseph, Architects.

THE

Architect and Engineer

Of California

Pacific Coast States

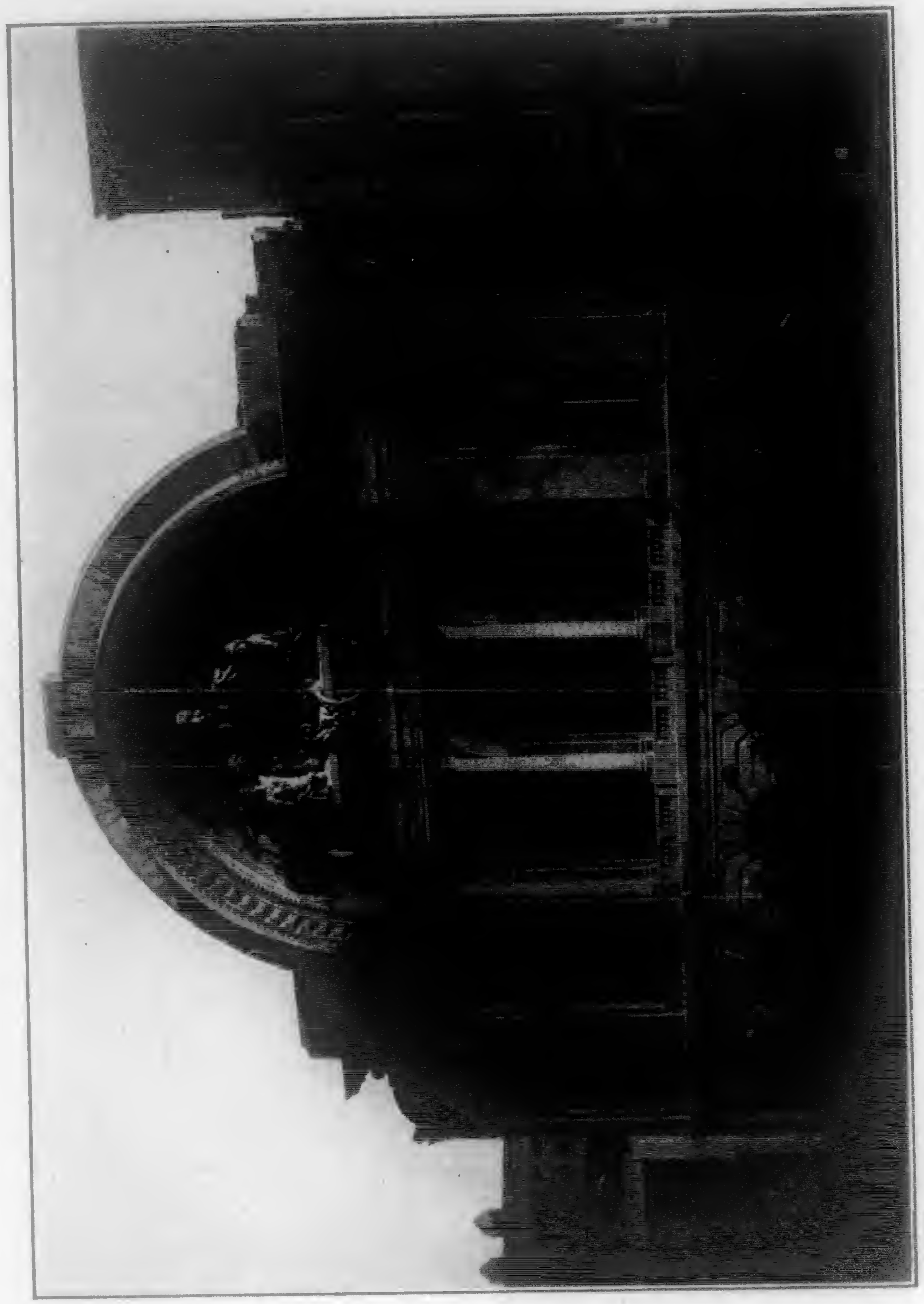
VOL. XVII. JUNE, 1909. No. 2.

Some Novel Features of a Strictly Fire-Proof Theater Building

By G. ALBERT LANSBURGH, Architect.

[*In designing the splendid new Orpheum Theater in San Francisco, the architects, Messrs. Lansburgh and Joseph, were confronted by two somewhat difficult problems. First, with limited floor space, they were required to provide seating accommodations for 2,500 persons and to introduce a great number of loges, the demand of the Orpheum patrons for box seats being more than ordinary. Second, the architects were instructed to produce a building that should be at once handsome, comfortable and absolutely fire-proof. The wishes of the theater management have been carried out to the letter and as a result San Francisco has today a play house second to none of its kind in the country. In its construction the most rigid requirements of the Fire Underwriters were complied with. A conflagration within the structure would seem well nigh impossible.*—EDITOR'S NOTE.]

LET US start by dealing with the first problem: The location, an inside lot 107 feet 6 inches front by 137 feet 6 inches depth, upon which the Orpheum Theater stands, was just about as small as it was possible to utilize for the solution found, and our great problem was to seat twenty-five hundred people comfortably. This we succeeded in doing by using the three galleries and by somewhat encroaching upon the vestibule, as well as by building the staircases outside of the auditorium proper. The result of this difficulty has probably been productive of a novel arrangement which, from all appearances, would seem to be of great benefit for future theaters. This is the double staircase built on either side of the entrance vestibule. These two staircases, one leading to the balcony from the vestibule and the other to the gallery from the street, are built in the same well, inclosed by fire-proof partitions dividing not only one from the other, but also the two flights from the main house, thus providing a double safeguard against fire or panic. Each run of stairs is comparatively short and has a big landing at each corner of the well, in this way rendering it impossible for anyone to fall any considerable distance or for any great crowd to fall at the same time, and so block the passage of those following, as was the case in the Iroquois Theater fire at Chicago. This double staircase the writer first saw executed in the shape of a double spiral inclined plane leading down the great well of Orvieto in Italy. This solution was also arrived at through a case of necessity, as the problem at Orvieto was to draw vast quantities of water from a great depth to the surface and then carry this water a considerable distance to the town. Mules were consequently laden with hampers and driven down one incline to fill the paniers and up the other with their burden. There was, therefore, no interference whatsoever during the day's labor.



The New Orpheum Theater, San Francisco, Cal.
Lansburgh & Joseph, Architects.

Frontispiece,
The Architect and Engineer of California
June, 1909

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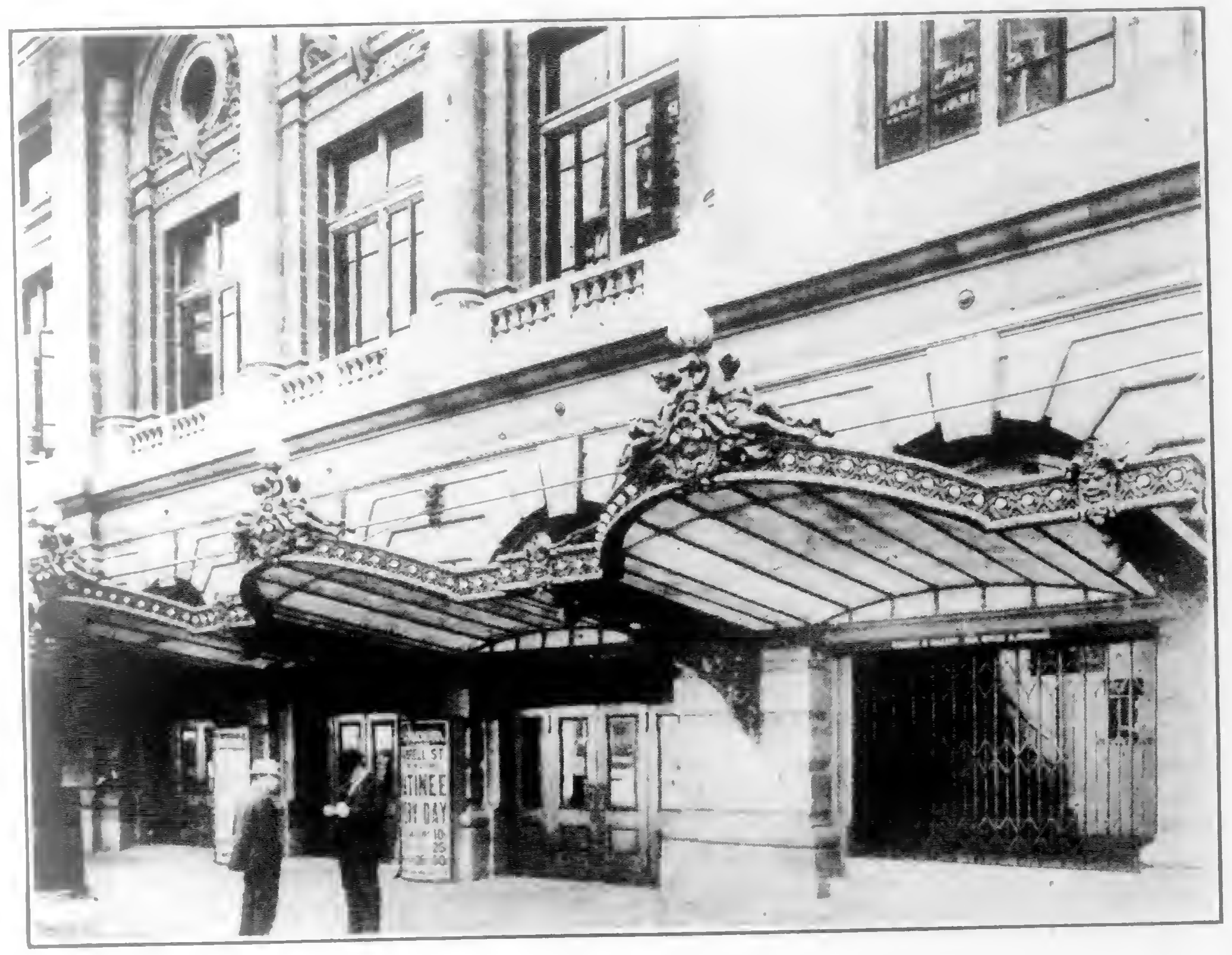
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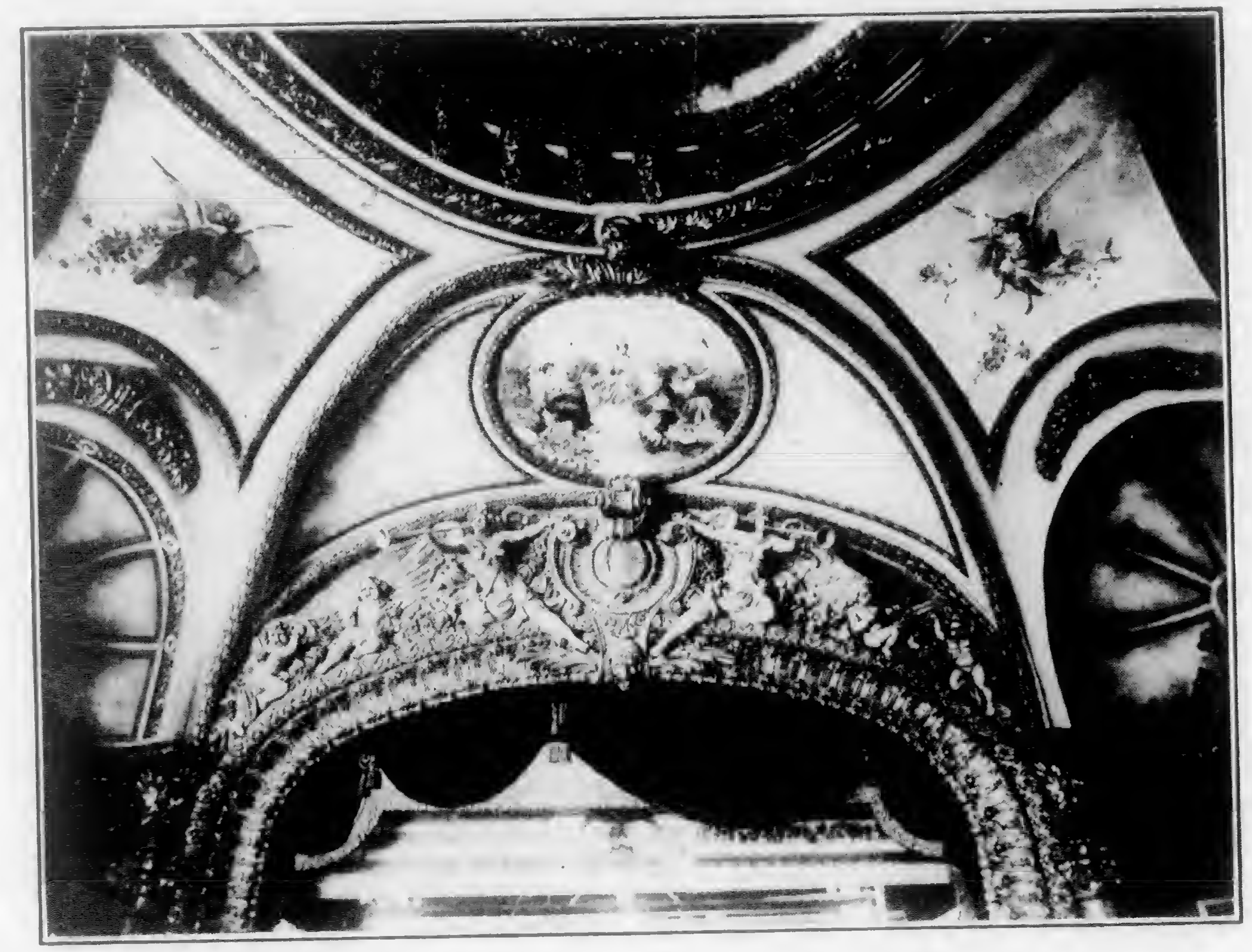
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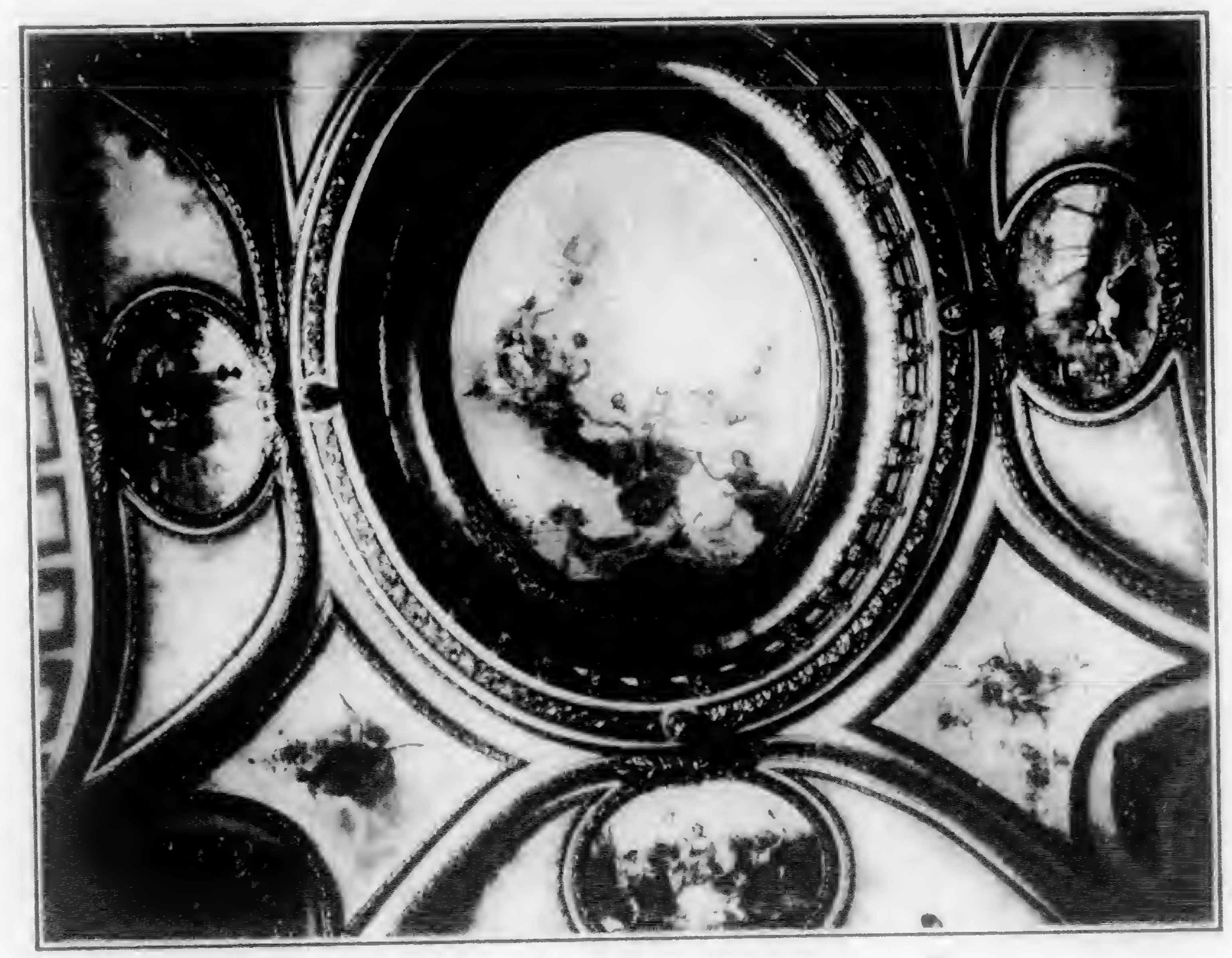
Detail of Marquise, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.



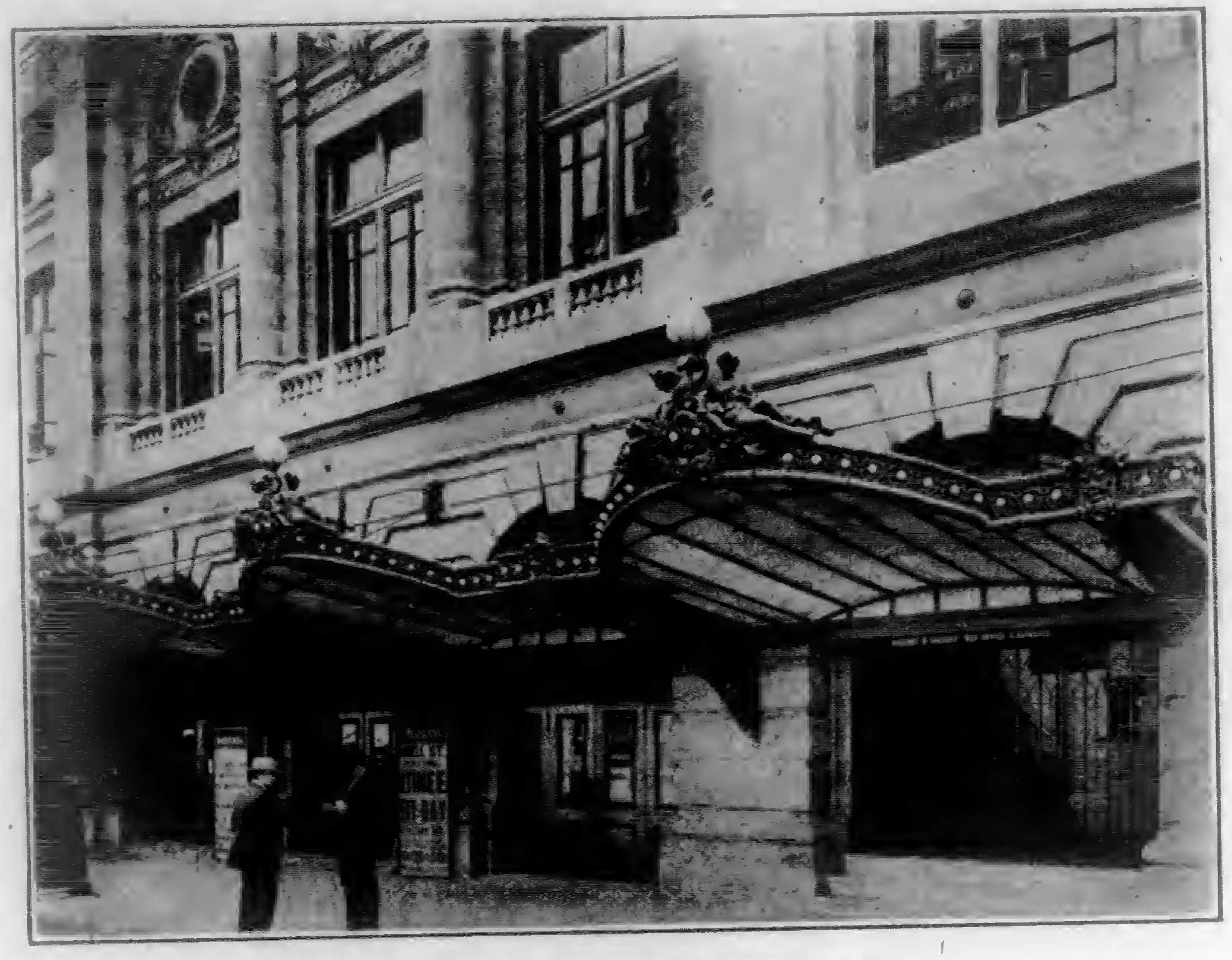
Lobby, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.



Proscenium Arch, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.



Ceiling, Orpheum Theater, San Francisco.
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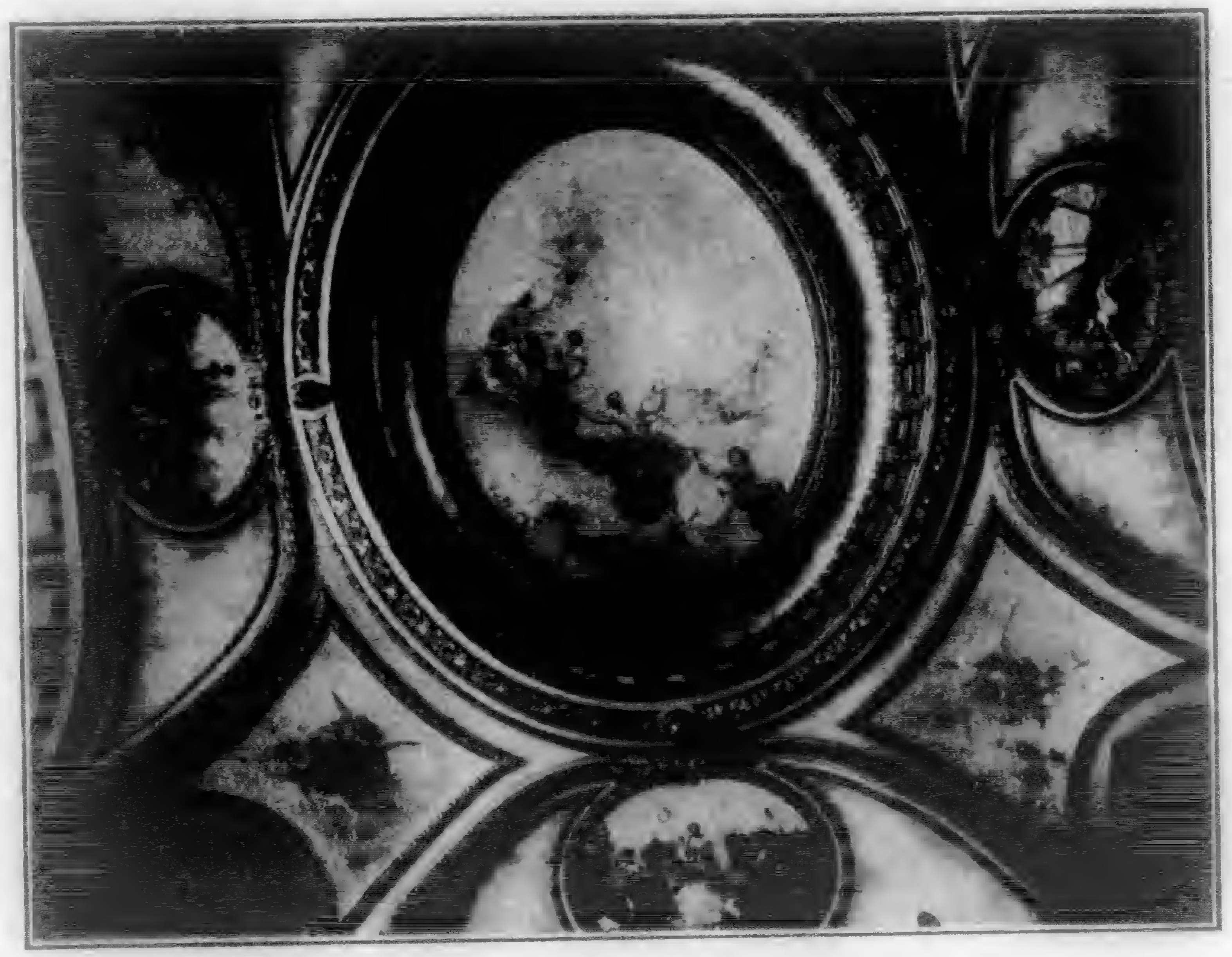
Detail of Marquise, Orpheum Theater, San Francisco.
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Lobby, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.



Proscenium Arch, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.



Ceiling, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.

Our second problem was rather an interesting than a disturbing requirement, and that was to build an absolutely safe house and render it as attractive as possible.

It has always been the principle of the Orpheum Theater and Realty Company to elevate the vaudeville stage so as to draw to it patrons from the higher walks of life and to give them the enjoyment of high-class varieté. The vaudeville stage is daily, in America, becoming more popular owing to the remarkably poor "mise en scene" of most dramatic productions that the American public has not only been forced to accept, but seems absolutely ready to patronize. The vaudeville stage is gradually taking to itself interesting farces of a dramatic character and gives employment to the greatest operatic stars in the country. Unfortunately, not enough of them have ventured as far west as San Francisco, but in the East such engagements are rapidly becoming extremely popular and frequent. Hence, the Orpheum's desire to suit its house to a dressy and classy audience.

Solve Problem of Acoustics

From a decorative standpoint we have endeavored to create something new and have thus broken away from traditional lines. In this we have proven, we think, that many of the principles of acoustics which heretofore have taken up the architects' attention as a mechanical requirement, are false. If you will note, there is no old-fashioned proscenium arch, or sounding board, as it was called, to render the acoustics perfect. We have even gone so far as to make the domed ceiling rather deep, and, although we have no very sharp angles, there are any number of nooks, corners, niches and projections, which would, up to the present time, have been considered absolute suicide, so far as acoustics are concerned.

The question of sight lines is one purely of descriptive geometry. They have, naturally, been most carefully worked out, but acoustics is not a matter of an exact science. It is merely a question of chance and when one realizes that in all the many times that he has gone to the theater it is hard to recall a single instance where he has not been able to hear, at least fairly well, he will agree that the chances of failure are rare. Hence, why should not the decorator risk something, in order to produce a composition differing from its neighbors?

Not only does the Orpheum management require that its patrons be artistically satisfied, but it absolutely insists that its audiences be comfortably and sanitarily cared for and that it be given every protection against panic.

To this end, the sum of $20,000 was spent for an elaborate and modern ventilating system. This system has never been used in the West up to this time, but the most modern houses in New York have made use of the same. This system originated in France, but even after installation was not used, owing to the excessive cost of the fuel necessary for its maintenance. To explain this system technically would interest none but the ventilating engineer, but to give the public, and those of my confreres who do not care to go more deeply into it, a general idea, I will describe it as follows:

The air is taken in through the exit courts and filtered by being drawn through coke washers over which a cataract of water is constantly running. After being thoroughly cleansed, it is passed over heated steam coils situated under the rear portion of the auditorium and brought into what is known as the plenum chamber. This plenum chamber is situated immediately under the orchestra floor. There is a smaller plenum chamber which likewise admits fresh air between the ceiling of the orchestra and floor of the balcony.

The air passes through the appertures under the seats into the auditorium at the rate of one foot a second, thus causing no disagreeable draught on the spectators. In rising it takes with it the vitiated air and smoke, thus constantly changing and purifying the air. Huge electric fans draw it forth through the dome ventilators and from the pockets under the balconies and galleries.



Side View, Showing Boxes and Balconies, Orpheum Theater, San Francisco. Lansburgh & Joseph, Architects.

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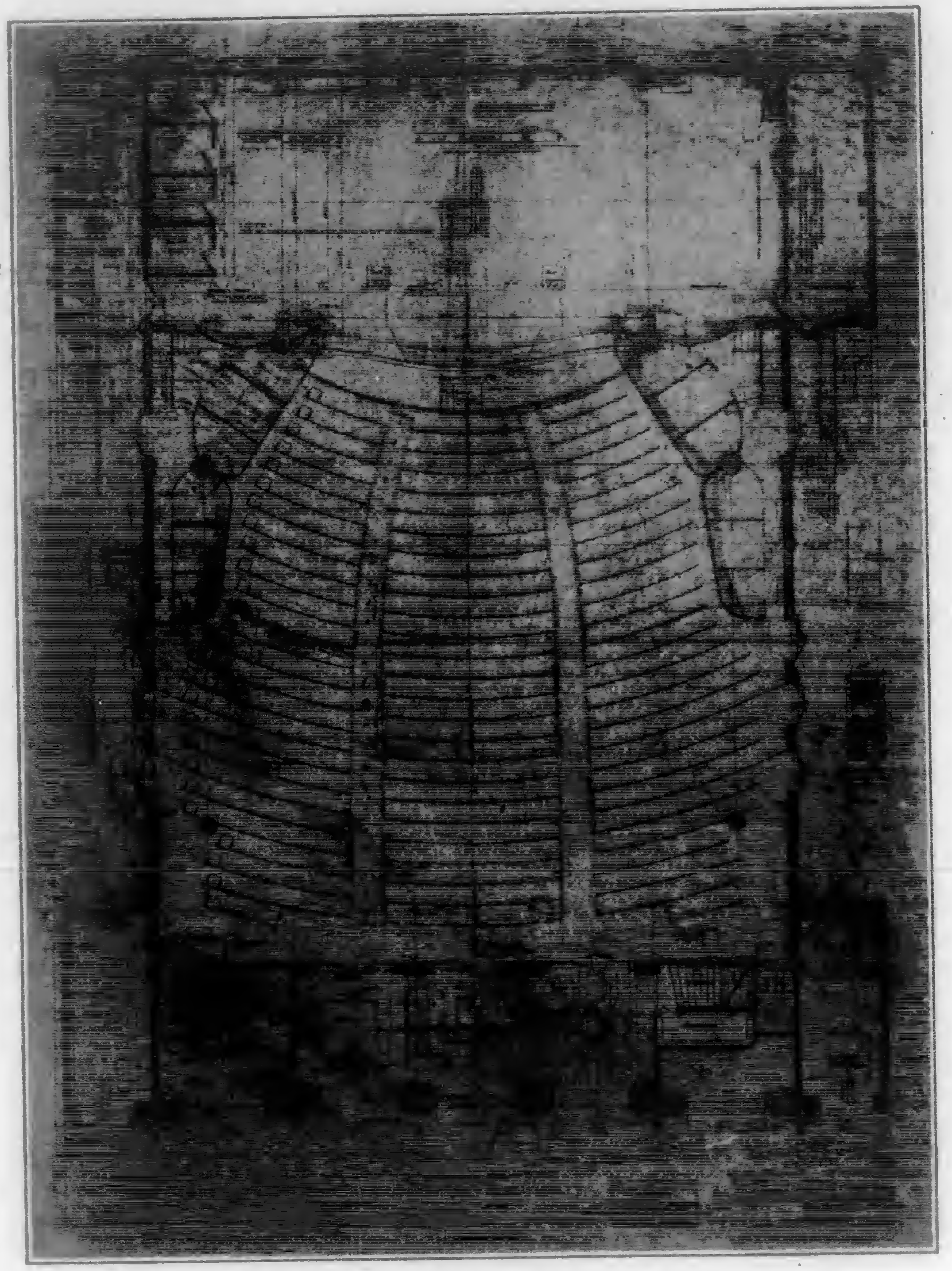
To this end, the sum of $20,000 was spent for an elaborate and modern ventilating system. This system has never been used in the West up to this time, but the most modern houses in New York have made use of the same. This system originated in France, but even after installation was not used, owing to the excessive cost of the fuel necessary for its maintenance. To explain this system technically would interest none but the ventilating engineer, but to give the public, and those of my confreres who do not care to go more deeply into it, a general idea, I will describe it as follows:

The air is taken in through the exit courts and filtered by being drawn through coke washers over which a cataract of water is constantly running. After being thoroughly cleansed, it is passed over heated steam coils situated under the rear portion of the auditorium and brought into what is known as the plenum chamber. This plenum chamber is situated immediately under the orchestra floor. There is a smaller plenum chamber which likewise admits fresh air between the ceiling of the orchestra and floor of the balcony.

The air passes through the appertures under the seats into the auditorium at the rate of one foot a second, thus causing no disagreeable draught on the spectators. In rising it takes with it the vitiated air and smoke, thus constantly changing and purifying the air. Huge electric fans draw it forth through the dome ventilators and from the pockets under the balconies and galleries.



Side View, Showing Boxes and Balconies, Orpheum Theater, San Francisco. Lansburgh & Joseph, Architects.



First Floor Plan, Orpheum Theater, San Francisco.
Lansburgh & Joseph, Architects.

Precautions Taken Against Panics.

As to the security of the theater, I know of no more positive means of impressing it upon the public, than by publishing the following extract of a letter from Marsden Mansen, the city engineer, to the architects:

"It has afforded me great pleasure to note the plan and execution of work on the new Orpheum Theater on O'Farrell Street below Powell. This theater so closely follows the law which it was my duty to draft for the protection of theater-goers, that it has an added interest. Since drawing that law I have

inspected theaters in many of the Eastern and some European cities. You will, therefore, pardon me in offering two suggestions which may have been fully considered by you in the past but which I desire to renew with a view to making the theater which you have designed the most perfect within my observation. These suggestions are:

"That instead of putting in a maple floor that you float the concrete evenly with cement mortar and let down to this with water-proof glue battleship linoleum, an absolutely fire-resisting material.

"That the seats be made of vulcanized fibre, a material which burns like a piece of wet cork.

"Please pardon any seeming presumption on my part by reason of the deep interest I feel in the success of your very handsome work.

"Respectfully yours, MARSDEN MANSON."

Let me add that, notwithstanding the fact that a building may be supposed to be undemolishable by fire there is always a great source of danger from panic, since almost before a fire can really attack the audience, it has done itself more bodily injury by fright than otherwise. To prevent such an occurrence there are thirty-two exits from the auditorium proper, each supplied with automatic openers which operate under the least pressure. The vast fire escapes on either side render it imposible for any one to be locked in the theater for any length of time. Not only is the audience protected with these means of exit, but the dressing rooms and working parts of the stage and basement are amply provided for.

The house is literally irrigated with fire hose lines and sprinkler pipes. The pipes for this system are supplied from two sources, one being the Siamese connections on the front of the building for the fire department and the other the twenty-five thousand gallon tanks of water under pressure upon the roof above the gridiron. And all this to extinguish fires that could only take hold of a few draperies and chairs, since the curtains and scenery are either treated with fire proofing or are made of asbestos, and the general construction being absolutely a class A fire-proof building, steel frame and reinforced concrete floors and walls.

As to the general design of the building, it is modern French renaissance, ultra modern, if you will, bearing the detail and character, very frankly marked of a vaudeville theater.

The facade is of terra cotta, made to imitate Colusa sand stone, and is later on to be surmounted with three groups of sculpture. The marquise covering the five entrances is of wrought and cast iron.

As we enter the vestibule we find the box offices on either side, with the stairs to the balconies adjoining and the six pairs of doors to the orchestra floor directly in front of us. This vestibule is in Caen stone and is really a transition between the exterior and the warm colors and decoration of the interior. The only colors used are in the five lunettes above the cornice of the doors.

The color scheme of the theater proper is an old rose ground on the walls, with the relief work of bronze, high lighted, with gold leaf. The ceiling has an ivory ground with the sculptural work in gold, forming frames for the paintings in the panels by A. F. D. Cavallero. The dome itself is a huge picture frame in which E. Theo. Behr's painting, "Apollo and the Influence of Music," is admirably encased. The draperies are of old rose and gold.

The interior is generally lighted by concealed lights in the dome in addition to which candelabra and brackets, as well as soffit lights, are used.

The designing and execution of this building has been a very interesting task, and it is especially pleasant to us to find that, in general, it has met with the appreciation of the San Francisco public, which we thank very heartily for its approval.



Life-like Lions Prowling on the Lawn of Mrs. W. C. Talbot.

Lions of San Francisco

By HORATIO F. STOLL.

IF HE desired to study the lion at close range before penetrating the wilds of the African jungle in search of large game, Theodore Roosevelt might have employed a day to advantage in San Francisco.

In the old days, before the fire, the entrances to the homes of our city's millionaires fairly bristled with noble lions of every variety. Their favorite attitude was rampant, but they also affected a passant, saliant, statant, sejant, couchant and dormant air. The destructive fire killed off a large number, but we can still boast of some fine specimens and the day is probably far distant when our marble lions will become extinct. Most of those that remain were chiseled from the finest Italian marble and, as our climate is not particularly severe on such substantial material, they are likely to be with us for many generations to come.

Away back in the 60's, when General D. D. Colton built his pretentious home on Nob Hill, he flanked his entrance with two impressive marble lions. Early San Franciscans, unused to the novel sight, stood awe-stricken before these handsome beasts and scrutinized them closely. They had to admit they added "tone" to the general's residence, for they suggested the coats of arms and crests of foreign kings and noblemen and conveyed the idea of family strength and superiority.

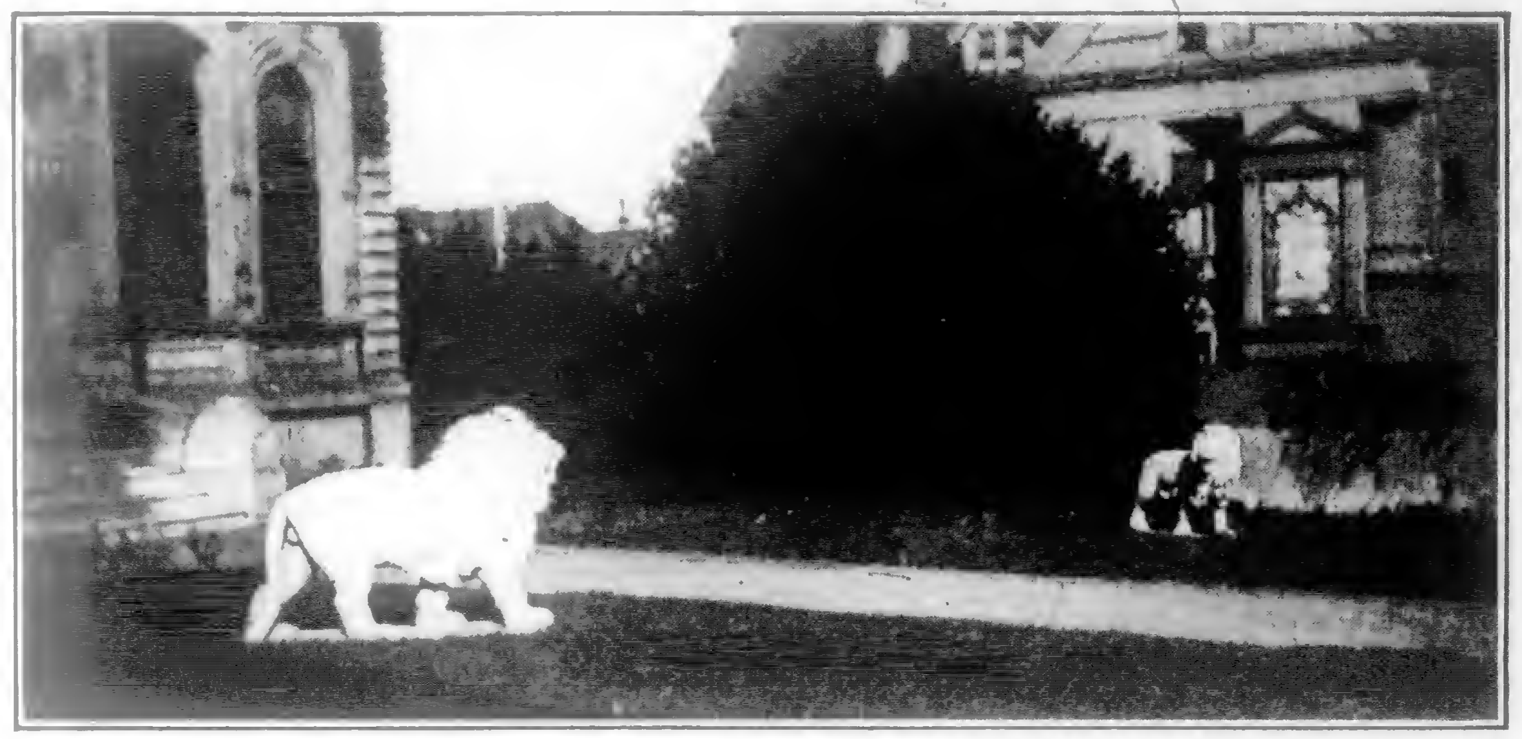
The custom of placing lions, griffins (winged lions), and other symbolical beasts at the approaches of palaces, temples and mausoleums is very ancient, so General Colton had plenty of precedent to justify his innovation. Besides, naturalists, poets, moralists and fable writers have unanimously crowned the lion king of beasts and he has been duly accredited with every royal virtue, such as fearlessness, courage and magnanimity. In art he has taken the same exalted position, crowning the gates of Mycenae; flanking the entrances of palaces of Nineveh; enhancing the dignity of the Pharoahs; guarding the steps of the throne of Solomon; beautifying the famous Court of Lions in the Alhambra; typifying in the lion of Lucerne undaunted bravery; around the column of Nelson in Trafalgar Square, London, symbolizing all that Britons associate with the grandeur and might of their country; adding impressiveness to the heraldic arms of Spain, Holland, Denmark, Bohemia, Saxony and many lesser countries.



Mr. George A. Newhall's Beautiful Marble Lions.



The Well Groomed Lions That Guard the Will Irwin Home, San Francisco.



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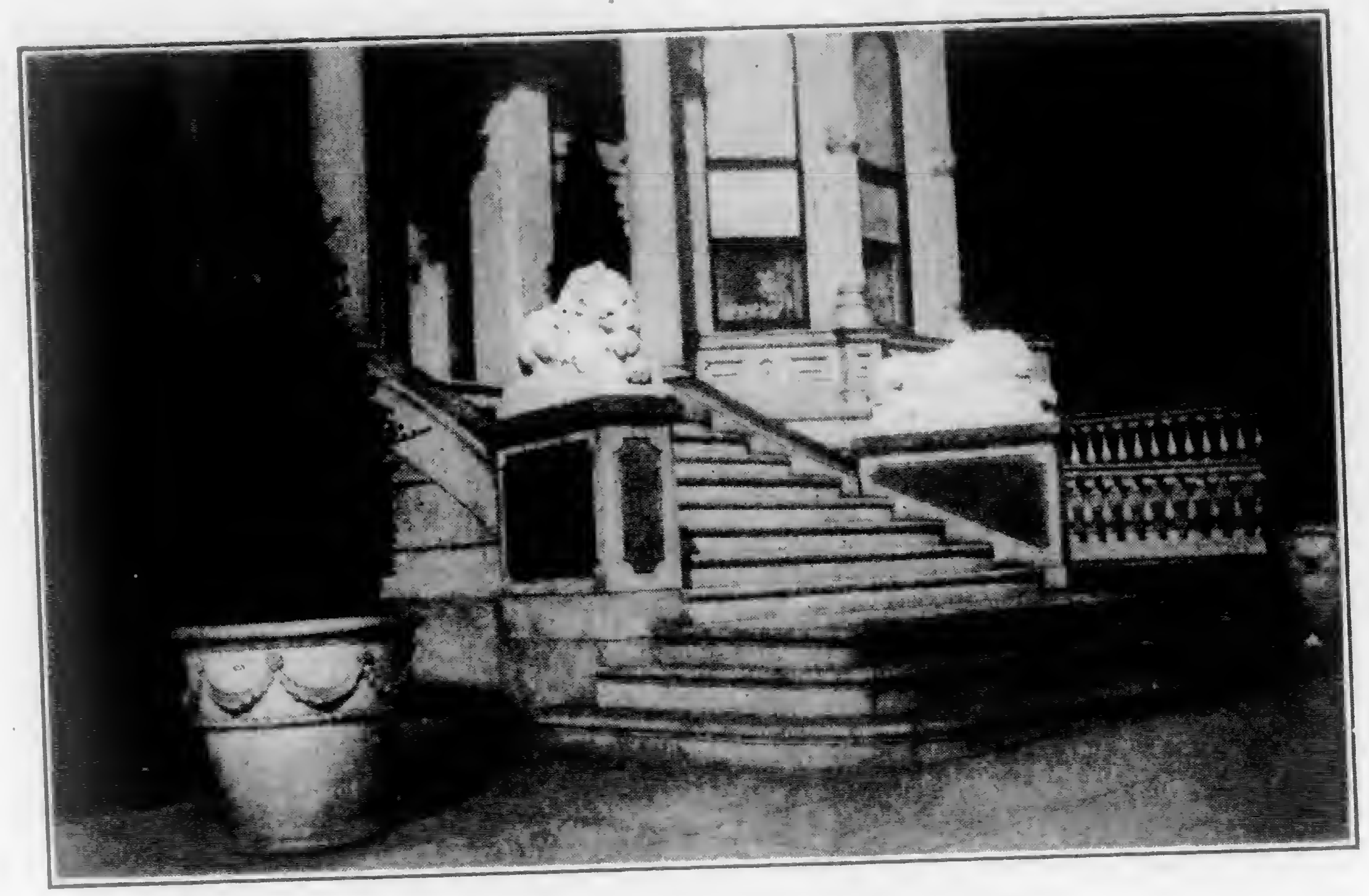
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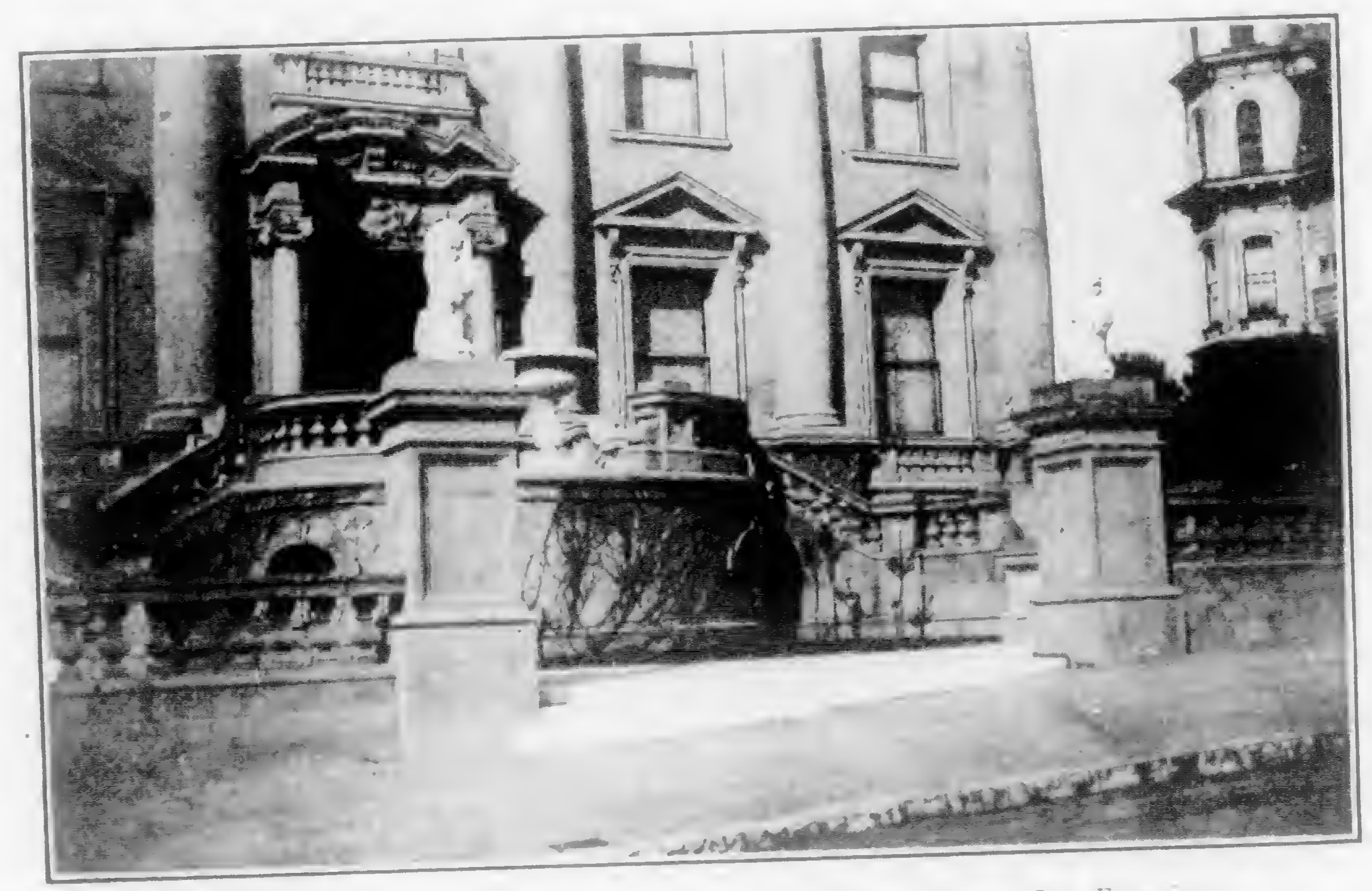
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But I am digressing. I was speaking of General Colton's novel lions. Wealthy San Franciscans liked the idea, and although the lions were costly and difficult to secure—most of them were imported, not from the jungles of Africa, but from the studios of sunny Italy—they felt their new residences were not complete without a pair of guardian lions. The fad for lions passed in a few years, but those that were installed were never molested — that is, until the time of the great conflagration, when many noble beasts were disfigured beyond all recognition.

But in spite of the ravages of the fire, we still have some interesting lions on view that are worthy of comment. Take, for example, the life-size lions that embellish the stairway of George A. Newhall's home on Pacific avenue, between Webster and Fillmore streets. They have an interesting history. They were modeled by O. Andreoni, of Rome, and are copies of lions by the celebrated Canova that are to be seen today at St. Peter's, Rome. One, wonderfully life-like, sleeps while the other, with blinking eyes and stupid aspect, keeps watch. When the Newhall house stood on the corner of Van Ness avenue and Sutter street, there was a similar pair guarding the entrance, but Mr. Newhall moved them into Laurel Hill cemetery after the death of his mother, Mrs. H. M. Newhall.

Two smaller animals, resembling the famous lion of Lucerne, ornament the long flight of stairs of the Cyrus Walker home on the southwest corner of Jackson and Gough streets. They are seen from the sidewalk at a great disadvantage. The huge granite balls that top the granite fence in the foreground detract from the lions, which are too high above the pedestrian to enable him to take notice of the beautiful work of the sculptor.

A block below, on Jackson street, at the northeast corner of Franklin, one observes two mighty man-eaters prowling on the lawn of Mrs. W. C. Talbot. They are facing one another, about 15 feet apart, and look as if they were ready any moment to engage in mortal combat. It is a good thing for the owner of these realistic beasts that the intrepid Tartarin of Tarascon is not likely to visit San Francisco in further pursuit of the elusive lion, the game of his dreams, for it is safe to say he would take a rare delight in shooting at these heroic and ferocious looking animals. They would prove infinitely better targets than the tiny jackass in the artichoke patch or the sacred lion of the desert and decidedly safer—since he would have only Mrs. Talbot to appease in case an ear or a bit of tail were sacrificed in the bloodless encounter.

The Washington street entrance of the massive stone home of the William G. Irwins, at the northeast corner of Laguna street, is also ornamented with two beautiful lions (sejant). They are seated royally on their hindquarters, very erect, their tails curled neatly about their feet and look too self-conscious and well-groomed to be very dangerous. These lions were designed and executed by Professor Petrelli in Florence. He, by the way, is one of the greatest sculptors of the present century and is famous for this style of work. His lions, griffins, and sphinxes are to be seen all over Europe, but especially in Italian gardens and villas. The Irwin lions were made of carefully selected, flawless blocks of white Carrara marble and were installed only five years ago. They were made especially for the places they now occupy.

Nowadays, the practice of using lions to embellish entrance steps of private residences in San Francisco is no longer in vogue. Nor is it customary in any part of the United States. They are used, however, in the entrances to buildings of a public character. In Washington, D. C., for example, lions adorn several buildings erected for the government. Two



The Cyrus Walker Lions.

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I notice that heads of lions in stone, cement and terra cotta are being used extensively in the exterior ornamentation of many of our new hotel, office and bank buildings. I have encountered only one pair of lions in the down-town district and they are the two shaggy headed cast-iron monsters that still crouch in front of the defunct California Safe Deposit and Trust Company's headquarters at California and Montgomery streets. These full-grown beasts were doubtless installed for the same reasons that the ancients used them—to convey the idea of fearlessness united with an extraordinary alertness in protecting whatever was confided to their care.

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broken off. No one seemed to interpret this mishap as an ill-omen or feel that new lions were needed. This showed bad judgment, for these hitherto conscientious guardians must have relaxed their vigilance, since they failed to protect the trusting creditors of the bank from the wily machinations of those in charge. Perhaps they were hypnotized or chloroformed.

Their troubled, worried expression these days gives one the impression that they realize they are in serious danger of losing their jobs and being consigned to the junk pile. That their fears are well founded is evidenced by the real estate sign recently displayed announcing that the site of the old bank building is for sale.

I wonder if the Smithsonian museum would not be glad to secure these unique lions. Perhaps the curator might like to install them next to the trophies which Colonel Roosevelt is sending home from the African wilderness.

* * *

Mark Twain's Country Home

HOW Mark Twain built an Italian villa without seeing it is told in "Country Life in America." The article describes "Stormfield," the humorist's new country home among the Connecticut hills. Here is an extract:

"The joy of country life has entered deep into the soul of the man. He loves the seclusion that his fame will not permit in the city, but he loves people, too, and draws about him from the outside world friends of his own choosing. He loves the house itself.

"It was designed by John Howells, son of the Howells," Mr. Clemens tells you, "and he and my daughter Clara and Miss Lyon planned out its particulars and built it, and they did it without any advice or instructions from me. I had every confidence in their taste and judgment and none in my own. My meddling would only have made confusion. I was not willing to discuss the plans nor look at the drawings. I merely said I wanted three things—a room of my own that would be quiet, a billiard-room big enough to play in without jabbing the cues into the wall, and a living-room forty by twenty feet. For the rest they could do as they liked, and I had nothing more to do with the house until I drove up from the station last June to occupy it. I didn't want any of the bother of building. I had enough of that in Hartford when we built a $20,000 house on a $10,000 lot at a cost of $155,000. The only other stipulation was that the house should cost a certain sum."

"Did it?" I asked.

"Well, half of it," the philosopher admitted, smiling.

* * *

The Groom's Vote

A suffragette lecturer recently brought down the house with the following argument:

"I have no vote, but my groom has. I have a great respect for that man in the stables, but I am sure that if I were to go to him and say, 'John, will you exercise the franchise?' he would reply, 'Please, mum, which 'orse be that?'"—Pick-Me-Up.

"Pa!" "Well, what is it now?" "Pa, when I grow up, how will I keep from marrying the wrong woman?" "You won't."—Life.

Recent Federal Tests Showing Fire-Resistive Properties of Various Building Materials*

By RICHARD L. HUMPHREY, C. E.

[A bulletin describing the fire-resistive qualities of building materials will be issued within a short time by the United States Geological Survey, through its Technologic Branch. Various materials used in building were subjected to the direct application of heat for two hours, in the laboratories of the National Board of Fire Underwriters, in Chicago, the temperature reaching that of a conflagration. After being exposed to the fire, the materials were withdrawn from the furnace and quenched with water, in order to get the conditions that would obtain after the firemen had begun their work on a burning building.

The investigations, which were conducted under the direction of Richard L. Humphrey, engineer in charge of the structural materials laboratory of the Survey, are the first of a comprehensive series undertaken with the object of determining the fire-resistive properties and rates of heat conductivity of various building materials and the comparative efficiency of the various methods of fireproofing. The investigations have the further object of greatly lessening the liability of loss by fire in government buildings which are not insured and materially reducing their cost through more efficient methods of construction. While the tests are conducted primarily for the purpose of obtaining information of essential value to the Government, it is believed that the results will prove of much importance to the public.]—EDITOR'S NOTE.

INASMUCH as the tests herein recorded present many features of considerable importance, it has been deemed highly desirable to publish a detailed account of them, although the results are preliminary and inconclusive, and are presented solely for the purpose of making public the information required. They should not, therefore, be used as a basis for making conclusions, but merely as preliminary data regarding the relative fire-resistive qualities of the building materials tested.

The conditions under which these tests were made were unusually severe and none of the materials passed perfectly. The temperatures used would hardly be reached in an ordinary fire.

Much of the damage done to the building materials in this series of tests was occasioned by internal stresses, the gas flame of the furnace heating one face of the test pieces much more rapidly than the other. All the materials tested, including the hydraulic pressed brick cracked more or less. The concrete cracked least, but the tests indicate the necessity for using metal reinforcement in concrete walls to distribute the effect of the expansion.

The fact brought out most clearly by these tests is the low rate of heat transmission of Portland cement concretes and mortars. This is one of the desirable qualities in buildings intended for fire-proofing purposes. For marking the cement blocks, linen tags were fastened by wire nails to the interior walls at the time of molding. Most of these tags remained in place during the test and when the walls were demolished the tags in every case were found entirely undamaged.

An average of all the tests shows that about 90 per cent of the maximum temperatures attained by the faces of the panels were reached in one hour, while in the case of the mortar blocks the increase in temperature of the backs of the panels in one hour was only about 20 per cent of the total increase in the two

*Published by permission of the director of the United States Geological Survey.

hours. Of the solid concrete panels, the cinder concrete showed the smallest increase in the temperatures of the backs of the walls, and the granite concrete the largest. The total increase in the temperatures of the mortar panels was about the same as the total increase in the temperatures of the backs of the concrete, but the increase in one hour was somewhat greater in the case of concrete.

The damage done to the faces of the motar and concrete panels would probably be caused at a temperature about half that of the maximum temperatures reached, owing to the water of crystallization being driven from the mortar. This thin layer of dehydrated mortar may have formed a protective coating and prevented dehydration.

The backs of the brick panels also showed a small increase in temperature, but the natural building stones and tiles proved poorer non-conductors of heat.

It is apparent that the strength of the webs of ordinary hollow blocks is insufficient to resist the stresses set up in these tests, as in many tests the rapid rise in temperature and the subsequent quenching of one of the faces of the blocks caused the webs to split. It was noticeable that the richer the mortars used in these blocks the better they withstood the tests. The amount of water used in mixing the mortars had a similar effect on the fire-resistive qualities; the mortars mixed with the greatest percentage of water gave the best results.

When the blocks were cracked or spalled before the application of water the damage appeared to be greater in the dry mixtures containing the greatest percentage of sand, and it was further observed during the fire test that the richer mixtures warmed up more slowly than the others. It is apparent that one of the causes of weakness in the cement hollow building blocks under these fire tests was the weakness of the concrete, a too dry and lean mixture, which, coupled with the thinness of the webs, provided insufficient strength to resist the stress due to the rapid expansion of the face. It is quite possible, as was shown in some of the block tests, to make blocks which will pass the conditions perfectly; the web must be thick enough to give the necessary strength.

The brick panels probably withstood the tests better than the other materials. The common brick tested comprised unused new Chicago brick, and used St. Louis brick. Fifty per cent of the new bricks were split, while sixty to seventy per cent of the old bricks were not damaged. Lime knots seemed to be responsible for most of the damage to the new bricks, as they were found at the bottom of nearly all the cracks. The bricks at the back of the panels were entirely unaffected. While the strength tests are not conclusive there is apparently little difference in the strength of the bricks before and after firing.

The hydraulic-pressed brick withstood the test very well. No damage was apparent after the firing and before the water was applied, and although a number of the bricks cracked, seventy per cent of them were found to be sound after quenching.

The sand-lime brick did not withstand the test as well as expected, but the sample tested, which was purchased at random, appeared to be somewhat below average quality.

The concrete behaved remarkably well and it was difficult to determine whether the limestone, granite, gravel, or cinder concrete sustained the least damage. The faces of all the panels were more or less pitted by the fire and washed away by the stream of water. The test was unfair to the cinder concrete as the cinder was very poor, containing a large percentage of unburned coal; however, the sample selected was the best of six or eight investigated in St. Louis. During the fire test the coal ignited and left the surface of the concrete very rough and badly pitted. The limestone aggregate in the face calcined, and the granite aggregate split and broke away from the surface mortar. The

granite concrete probably behaved better than any of the above mentioned concretes. Damage in no case extended deeply, probably not more than 1½ inches. The evidence shows that even at this depth the temperature was comparatively low. The high stresses produced in the panels by the rapid rise of the temperatures of the faces, while the backs remained cool, caused cracks. On taking down the panels the blocks of concrete were found to be cracked vertically for some distance from the face. The serious damage done the various natural building stones precludes any comparison among them.

The tile tested was bought in the open market and in one panel was taken from a lot of material about to be erected in a building. A large percentage of the faces of the tiles were washed away by the water, and the material composing the faces became soft and could easily be crumbled in the fingers. There was a comparatively rapid rise in the temperature of the backs of the panels. The plaster on the partition panel tile fell off a few minutes after the test was started.

* * *

To Try Growing of Eastern Hardwoods in California

THE Pacific Coast will soon be the scene of an interesting tree-growing experiment. The United States Forest Service is planning to introduce a number of the more important Eastern hardwoods into California, and will this year experiment with chestnut, hickory, basswood, red oak and yellow poplar or tulip trees. Small patches of these trees will be planted near the forest rangers' cabins on the national forests, and if these do well larger plantations on a commercial scale will soon be established on wider areas.

There are over 125 different species of trees in California, a number of which produce some of the most valuable varieties of lumber in the country. Although considerably over one-half of the species are hardwood or broad-leaved trees, yet, with the exception of the exotic eucalyptus, there is not a single species of hardwood here ranking in commercial importance with the leading Eastern hardwoods. Climatic conditions in many parts of California are undoubtedly favorable for the growth of a number of the valuable hardwoods, and the absence of these trees is due mostly to unfavorable factors of seed distribution.

If the experiments are successful, a valuable asset will have been added to the forest resources of this State, which should prove of special benefit to the local furniture and vehicle industries. Chestnut and red oak are highly esteemed for furniture, while with hickory, basswood and eucalyptus at its command, California should lead all other States in the vehicle industry.

* * *

He Knew

The teacher was giving a geography lesson, and the class, having traveled from London to Labrador, and from Thessaly to Timbuctoo, was thoroughly worn out. "And now," said the teacher, "we come to Germany, that important country governed by the kaiser. Tommy Jones, what is a kaiser?" "Please, 'm," yawned Tommy Jones, "a stream o' hot water springin' up and disturbin' the earth!"



Design for First National Bank Building, San Jose.
L. B. Dutton, Architect.



Made of Koa or Hawaiian Mahogany.

The Possibility of Hardwood Panels for Interior Decoration

WHEN Mark Hopkins, away back in the latter 70's, decided to outdo his wealthy neighbors who had erected palatial mansions on San Francisco's Nob Hill, he consulted the best architects in the United States, considered many widely different plans for the adornment of his commanding lot, and finally agreed that a modern English Gothic building was the most fitting for his lofty site. The architects, it is said, were given carte blanche to make the home as beautiful and artistic as possible. They were told to spare no expense, to use only the best materials, to ransack the four corners of the globe if necessary, to hire the most competent contractors, builders, decorators and cabinet-makers.

This they did. The home was a long time in building because the costly materials, especially the woodwork, had to be brought from the East and Europe, and there were necessarily many delays. When the great structure was finally turned over to the owners for occupancy, the whole investment—lot, retaining walls, reservoir, foundation, residence, furnishings and stable — represented an outlay of about $2,750,000. The mechanical excellence of every part of the house, to the minutest detail, was such as to excite the admiration not only of the professional architects and builders, but the unprofessional visitor as well. However, the feature which most attracted the attention of the visitor was not the

The illustrations accompanying this article are from actual photographs of paneled interiors made by E. A. Howard & Co. of San Francisco.



Design for First National Bank Building, San Jose.
L. B. Dutton, Architect.



Made of Koa or Hawaiian Mahogany.

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Living Room Paneled in Elm with Pine Trim.



Living Room Paneled in Quartered Oak.



Dining Room Paneled in Quartered Oak.



Dining and Living Room Paneled in Elm with Pine Trim.



Living Room Paneled in Elm with Pine Trim.



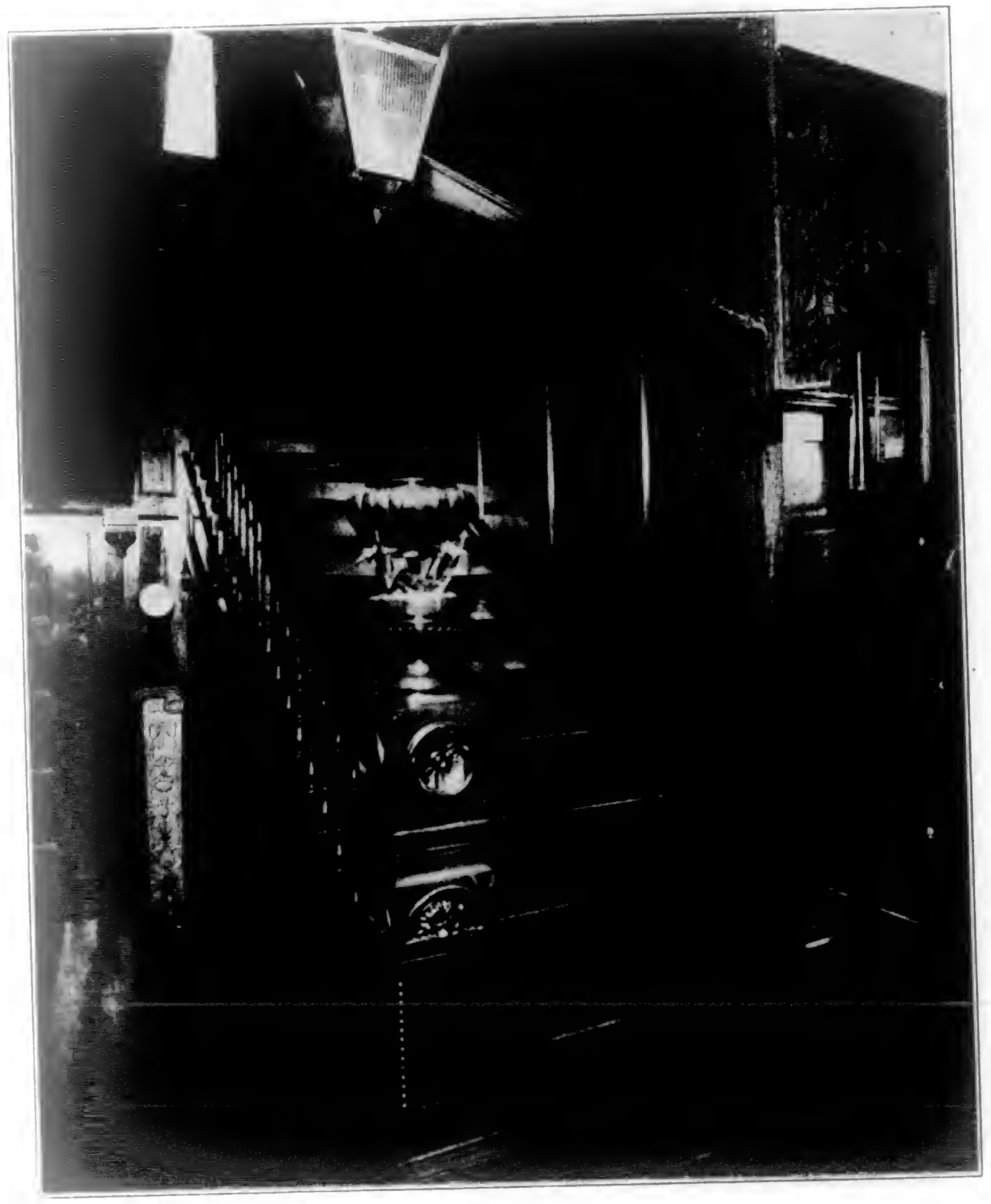
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Stairway Paneled in Quartered Oak.
(Old Residence Remodeled.)

steeply pitched roofs, the pointed arched windows, the spires and turrets, nor yet the beautiful frescoes, metal work and tapestry. It was the remarkable display of natural hardwoods, polished and wrought to a lustrous finish and exquisitely inlaid. In no other building in California—either public or private—could such a wonderful variety be found.

The walls of the main hall, or reception-room, which came to be known as the house gallery, when the property was turned over to the Regents of the University of California for the use of the Art Association in February, 1893, were ornamented with oak carved and inlaid with ebony, yamana and other woods. The ceramic room, formerly used as the dining-room, was in the English Gothic style, known as the "Talbert," and contained most artistically carved buffets, mantel pieces, wainscoting, ceiling beams and panels of English elm.

Then there was the Moorish room done in ebonized oak, with lamps of oriental make and walls covered with silk tapestries patterned after those of the Alhambra. Another room was fitted in bird's-eye maple, with tapestries of curious floral design. The music room was finished in

rosewood, as was also the curator's office on the second floor. The rosewood was inlaid in the latter with ebony and mahogany and the chandeliers were of silver. The large room on the same floor occupied by the regents of the University, was decorated with coco bolas wood, with brass trimmings. Still another spacious apartment, a reproduction of the state chamber in the castle of the Duke of Milan, contained carvings in the bow window of pear wood, being exceptionally intricate and graceful.

It was only a wealthy railroad magnate like Hopkins who could think of ornamenting his home with such priceless materials in the latter 70's. San Francisco had no facilities for turning out such handsome work; ocean and transcontinental transportation was slow; skilled artisans were few, and our native woods were left untouched.

How different conditions are to-day!

Instead of waiting months for materials to arrive from foreign lands, Mr. Hopkins could find practically everything he desired, no matter how scarce, right here in San Francisco. Beautiful woodwork is no longer a rarity. The virtues of our California and Oregon woods are recognized, and the fact that they are being worked to advantage by our mills has done much to encourage their use.

However, it is only since the introduction of hardwood veneer panels that the public is beginning to realize the possibilities of our California product for interior decoration. The manufacturers have reduced the cost to a very reasonable figure, and are turning out what they call a three-ply (one-quarter inch thick) panel, ranging in size from 2′ x 5′ to 2½′ x 7′, which can be used in a multiplicity of ways.

The old method of veneering was wasteful, expensive and slow. In the old days a few panels were made up at a time and your mill bill was necessarily high. To-day thousands of pieces are manufactured at once, and there is practically no waste. In order to reduce the cost to a minimum, of course, a standard sized panel had to be turned out. The stock that would otherwise go to waste is used for cores and backs. In selecting the stock for manufacturing panels, only the most beautiful wood can be utilized. Even in woods that are known for their beauty, it is only the occasional log that has unusual grain or figure. This log, by the new process, can be cut very thin for veneer work and made into a great many faces. The plainer stock is, of course, utilized for less conspicuous purposes.

One of the principal advantages of these new panels is the possibility of building up large surfaces, which bring out fully the beautiful grain of the different woods. Solid wood, even if it could be secured in large, uniform pieces, would not stay in place. It would warp and shrink. But by crossing the grain of the panels, it is possible to build up a surface almost any size and when the units are properly put together, it takes a mighty keen eye to detect that the panel is not one whole piece of wood. Worked up in this fashion, the wood will not warp, shrink or split.

The units, being plastic and not rigid, permit of endless designs and combinations. And, best of all, you can select your wood before it is installed and know exactly how it is going to look when it is in place. The panel surfaces are chosen from the dealer's stock, much as you pick out tapestry or wall paper. You can select those in which the grain is similar, or you can have each panel individual in character.

Each kind of wood has its own natural beauty. Quartered oak is undoubtedly the most popular finishing wood in use to-day. It is always in good taste, and it is the wood par excellence for panels for the dining room and hall. Because of its wide use, it is carried in a larger variety



Stairway, Paneled in Quartered Oak.
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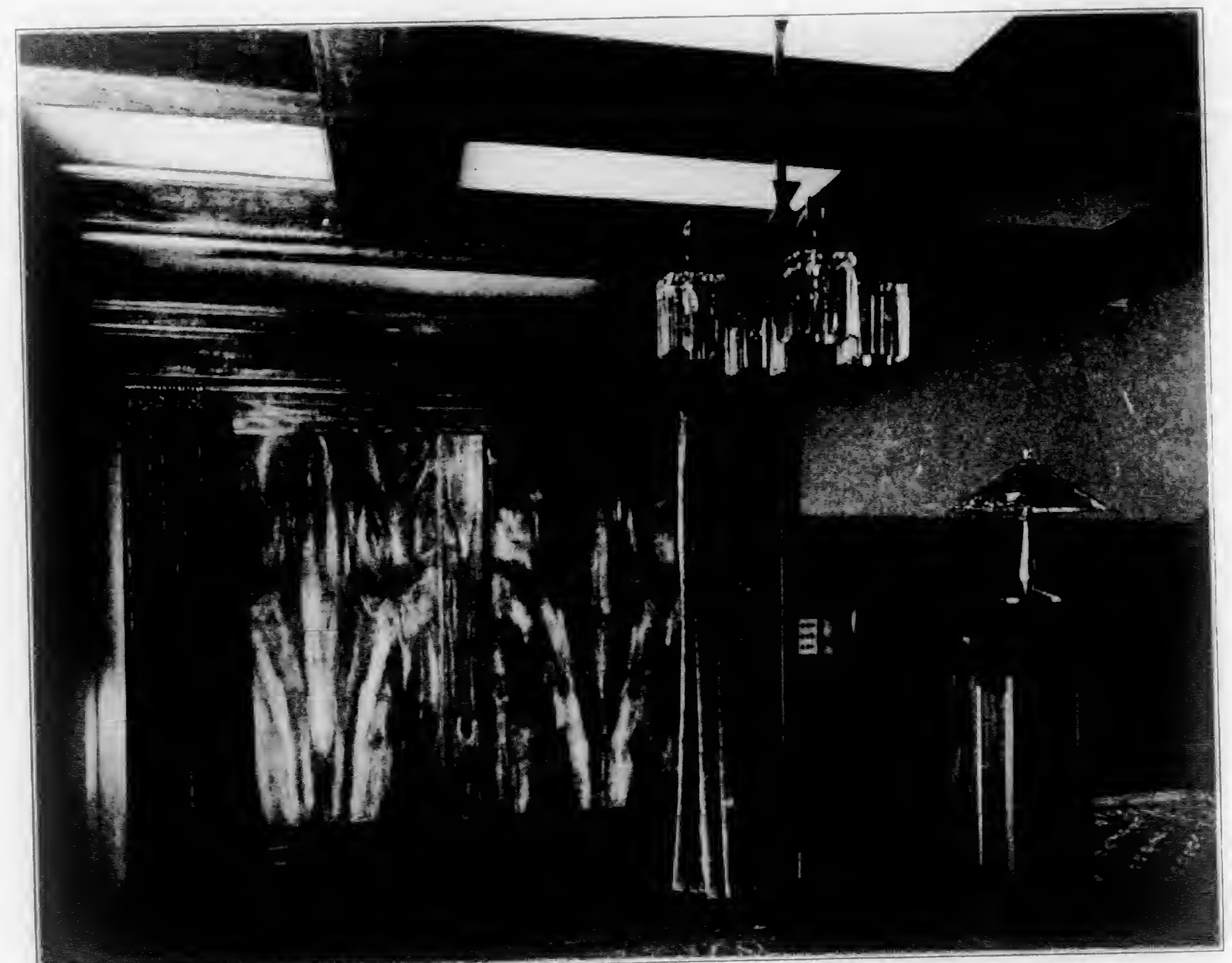
Den Paneled in Ash with Pine Trim.



Dining Room Paneled in Crotch Mahogany.



Billiard Room Paneled in Crotch Mahogany.



Hall and Parlor Paneled in Hawaiian Mahogany or Koa.



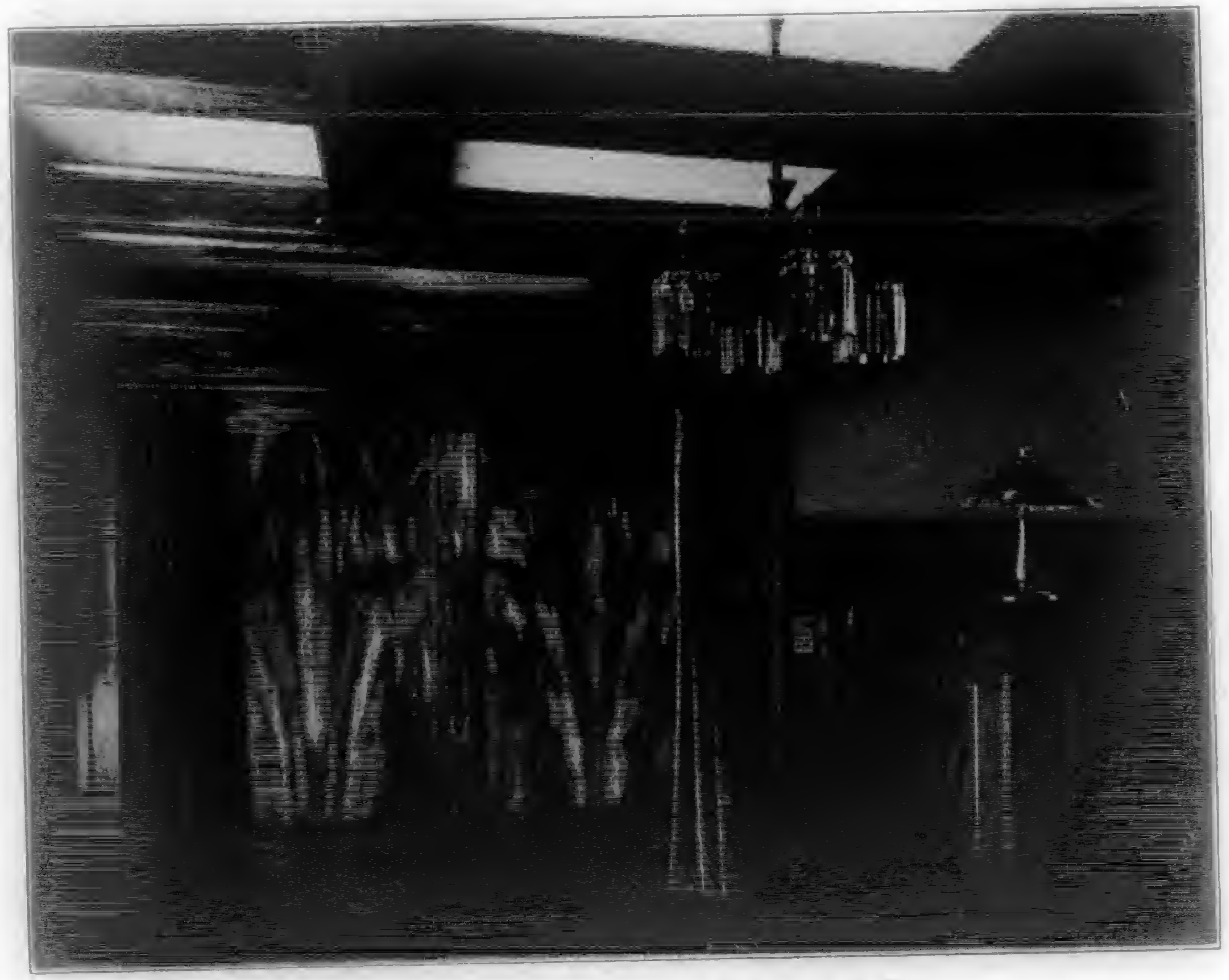
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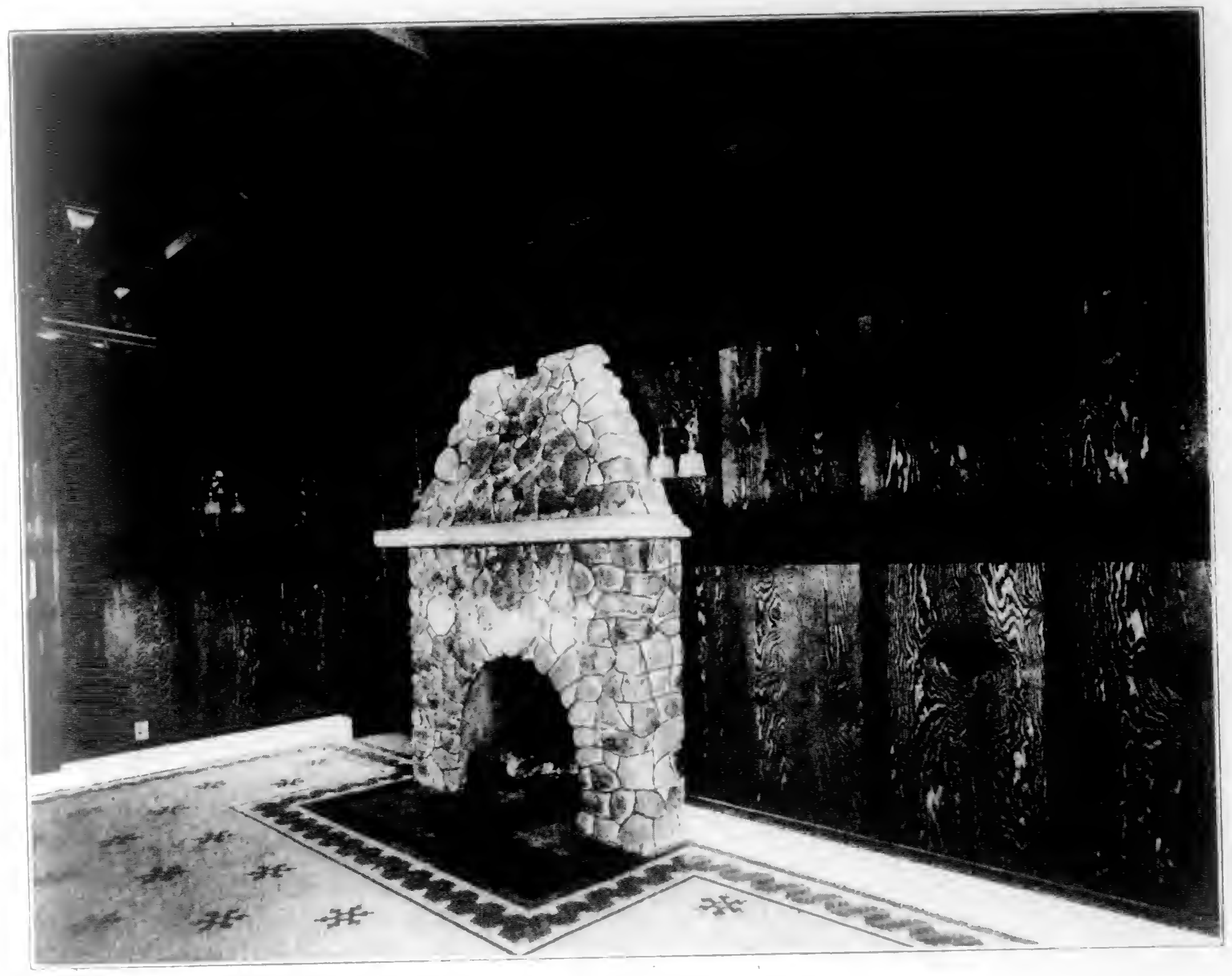
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Billiard Room Paneled in Pine.



Staircase Landing in Ash Panels and Pine Trim.

of sizes than any other hardwood. Plain oak is also popular. It takes any stain with good effect and looks particularly well in either the early English or the soft grays. It is tough, durable and easily obtainable.

Crotch mahogany is the king of all cabinet woods. The warm, red color darkens with age, always stays in place and never warps or twists. The crotches or junctions between trunk and branch, from which this wood is obtained, often have wonderful grain effects, which when built up make an especially rich panel.

Straight and curly birch panels are also very attractive. The wood is smooth, pliable, watertight and is one of the most desirable of American cabinet woods. It can be stained so as to imitate cherry and mahogany; in fact, the best imitations of mahogany are mare from birch.

Maple, too, takes almost any stain. The bird's-eye, blister and curly maple are not from different species, but are the results of fibrous distortions. Finished naturally—it requires great care—maple is very effective for a bedroom or show window, giving the light, cheery background desired.

Elm is a beautiful and inexpensive wood that lends itself readily to almost any color or degree of finish. The tall, straight trunks of the tree offer pieces of wood of considerable size. A living-room paneled in elm with pine trim is very attractive. Elm works in naturally with Oregon pine, oak and ash, and is within the reach of the modest home builder, being cheaper than pine.

Ash panels can be used in connection with pine finish also, taking readily the same stains and colors. It is one of the most important of the cheaper cabinet woods and heretofore has been used extensively in stairs and furniture.

And last, but not least, comes Oregon pine, which offers great possibilities. The beauties of the grain, however, cannot be brought out except in large surfaces. Most pine panels are cross-plied and all faces are rotary cut, thus securing a perfect figure.

Of course, the most expensive wood will look cheap if not properly used, and a more common wood will look beautiful if rightly handled. But one need not make a mistake, for the uses to which these panels can be put are many. It only requires a little thought and taste. They may be used to decorate the door entrance, the hallway or staircase. The living-room, dining-room, library, den and billiard-room can also be made distinctive. And for serviceability they can be introduced to advantage in public buildings, cafes, hotel lounging-rooms and in display windows. I have even seen them installed as the crowning glory of a particularly artistic fireplace.

The writer has in mind two dark brown oak panels that stand over the mantel of a unique fireplace in the dining-room of one of the new homes recently erected in the Ashbury Heights residence section. The panels are 2½′ x 4′ and are wonderfully grained. In one you can easily picture a beautiful sunset illuminating a bewildering array of scattered clouds. The setting sun, the brilliant rays, the fleecy clouds, all in proper perspective, are there and one marvels at the excellent work of the stainer. The panel looks almost like a painting. Every detail of light and shade has been worked out carefully. The second panel resembles a stretch of beach, the peculiar furrowed effect of the sand by the action of the waves being realistically reproduced.

These hardwood panels, by the way, are finished and sanded on one side and ready to install when purchased. The stiles and rails, or molding, which hold them in place and form the finishing part of the trim, may



Billiard Room Paneled in Pine.



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be secured already run. The stock carried by the mills is of such a varied character that you could pick out your panels and framework, so to speak, one day and begin to put them in place the next. There is no need of delay. And any clever carpenter or contractor can install them, or, if you desire, alter the design at the last moment.

The arguments in favor of these artistic hardwood panels are many, the principal inducements being beauty, permanency and comparative cheapness. Tapestry and wall paper must be renewed from time to time as they fade, are easily soiled and mutilated, and soon go out of fashion. Hardwood paneled walls, on the contrary, are always in good taste and will endure as long as the building. These qualities are sure to recommend them to intelligent home builders who are anxious to avail themselves of features that are aesthetic as well as practical.

* * *

A Word About Advertising

THE majority of men admit that advertising in the abstract is a great thing, and a great many believe, too, that advertising their own product is not only one of the ways, but practically the only way to build up a big business. There are, however, many peculiar things about the way people take advertising ideas home to themselves and dish them up. With the average business man, whether he is manufacturing mantels, tiles or brass tacks, when business is good and he has more trade than he knows what to do with, he turns a cold but cheerful shoulder to the advertising solicitor, and says, "Nay, nay." Sometimes he can be persuaded that advertising pays, even then, for though there may be more business than he can do, by increasing the quantity of demand right along he is enabled to take the cream or select the more desirable business, and let the other go for somebody else, and thus make his advertising pay him good returns, even though he is not able to take care of a large part of his business.

Generally the cry of the busy man is that he doesn't need any more, consequently is not prepared to take advertising until some such time as business may go slack and he needs to push his product to increase his trade. He says this in good faith, too, and all that, but just the same, when the panic hit last fall more people discontinued their advertising than during the busy time preceding that. Their first excuse was to curtail expenses until the storm was over, and the next was that no amount of advertising would get business under existing conditions. The people who didn't want anything wouldn't take it any way, and the only thing to do was to wait until the industrial situation improved somewhat and then go after the business. Of course, there are lots of inconsistencies in all this; in fact, the world is full of inconsistencies, and humanity probably has the lion's share of it all. We can't get over that, and probably needn't hope to, but we can pull up once in a while and take a new grip on things, and it looks like right now is the time for the industrial world, that part of it having products for sale and needing the markets seriously, to fall in and go to spending more money in printer's ink. There is probably no more need for this injunction in the mantel, tile and grate business than in any other industrial line; it is needed everywhere, and the wise man is the one that will go in, not recklessly, but judiciously, and advertise for trade, no matter what his line. That's the way to help get business. The man who keeps his product most persistently and properly before the people has the best show at the trade that is going, and will be on the ground floor when what is termed the revival does come.—Mantel, Tile and Grate Monthly.



Concrete and Stone Bridge, Main Street, Los Gatos, California. J. G. McMillan, Engineer.

Reinforced Concrete Bridges for County Roads

By J. G. McMILLAN, C. E.*

CONCRETE bridges are rapidly replacing the old style wooden and steel bridges, which formerly were a conspicuous but not altogether an attractive part of our county roads. The wooden bridge is no longer seriously considered by a wide-awake board of supervisors which realizes the many advantages of a reinforced concrete or cement structure.

There is no field of construction in which the use of concrete appeals more strongly to the practical business sense of the farmer than in the building of highway bridges. The flimsy and unsightly bridge structures of wood and steel are really more expensive in the end than bridges and culverts of concrete, which are at once beautiful, permanent and fireproof and require no painting or repairs. The somewhat higher initial cost of concrete bridges in some localities has retarded their adoption, but the vastly superior advantages of concrete cannot fail to ultimately impress the intelligent judgment of American farmers generally.

Concrete bridges were initiated into Santa Clara County in 1891, the first being a four-ring brick arch laid in Portland cement mortar; the side walls and foundation being of gravel concrete and boulders. There was one span, 36 feet long, with a twenty-four foot roadway. At the time the contract was let for this bridge, bids were also received on other plans, viz.: Two bids for a wooden bridge, $490 and $681; also one bid for a combination bridge, $690, and one bid for a wooden bridge with concrete piers for $971. The bid with concrete structure was for $1,025. The contract was let for $1,000, the deduction being made in consideration that the contractor leave off the plaster finish on the concrete structure.

*Mr. McMillan is County Surveyor of Santa Clara County, residence San Jose, Cal., and is a member of the Technological Society of the Pacific Coast.



Concrete and Brick Bridge over Penitencia Creek on Alum Rock Park Road.
First Concrete Bridge built in Santa Clara County.
Built October, 1891. Cost $1,000. Span 36 feet. Roadway 26 feet.
J. G. McMillan, Engineer.



Concrete Bridge over Stevens Creek on Mountain View Depot Road.
Cost $1,473. Span 36 feet. Roadway 20 feet.
J. G. McMillan, Engineer.



Concrete Bridge over Coyote Creek on Berryessa Road.
Cost–$13,332. Spans two—one, 68 feet, one 40 feet. Roadway 26 feet.
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Stone and Concrete Bridge over Llagas Creek on Leavesly Road.
Cost $3,703. Span 48 feet.
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Concrete Bridge over San Francisquito Creek on Pope Street, Palo. Alto.
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Concrete Bridge over Los Gatos Creek at Alma.
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Long Bridge on Saratoga Turnpike.
Cost $8,347. Two 60-foot Arches.
J. G. McMillan, Engineer.



Bridge over Llagas at Old Gilroy.
Span 32 feet. Roadway 20 feet. Cost $2,950. Built 1902.
J. G. McMillan, Engineer.

There are in Santa Clara County between thirty-five and forty concrete and stone bridges of more than twenty feet span.

The designs are made in harmony with the locality.

In the foot hills and mountains, where boulders and field stones are available, they are worked into the structure not only for harmony, but also, as a matter of economy. With the proper use of boulders and field stones a saving can be made in labor and cement of 25 to 30 per cent.

Up to 1902 most of the arches were constructed of brick, laid in cement mortar, nevertheless, plans were submitted and bids received, both on brick arches and reinforced concrete arches. Until 1904 the cost was in favor of the brick arch, since which time the cost has been in favor of reinforced concrete.

From 1891 to 1904 the cost of concrete, where sand and gravel were close by, was $5.50 to $6.50 per cubic yard; in 1907 and 1908 the cost ran up to $10 per cubic yard.

All the stone and concrete bridges withstood the earthquake of 1906, whereas many of the steel and combination spans were moved from their foundations.

So far all expense for maintenance has been eliminated.

In the East and Middle West many of the county boards are going on record as champions of concrete bridges in preference to all other materials. In Kansas recently the senate passed a bill which provides that the County Boards throughout the State must build concrete or stone bridges in all cases where the cost of a concrete or stone bridge is not more than thirty per cent in excess of the cost of a steel bridge. This notable piece of legislation is a most striking recognition of the merits of concrete and evidence of the growing conviction that this kind of material is the most satisfactory for bridge construction.



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The Integral Method of Waterproofing

From Cementology, March, 1909.

THE waterproofing of substructures is so obviously a necessity that it is no longer called into dispute; all who are engaged in construction work concede this as an indispensable provision toward safeguarding the foundations of the building. How to obtain the maximum of expenditure is still an open question, and one that invites reflection by those interested.

The two well-recognized schemes of structural waterproofing are:

First. The bituminous method, which requires the installation of an asphalt tar and felt mat over footings; on or in enclosing foundation walls and over concrete floors.

Second. The integral method, which is that of admixing with the cement a densifying and water-resisting compound. This scheme of waterproofing is appropriately named on account of the waterproofing being a part of the masonry, becoming integrated throughout.

Neither the bituminous nor the integral methods can be said to lack efficiency, as both have been widely employed with success. Yet it must not be overlooked that there are many considerations which become important factors toward determining which of these methods should be used in waterproofing substructures. These considerations are: Installation, strength, maintenance and cost.

Installation.

The Bituminous Method.—Excavation of earth so that outside walls may be covered, or the construction of retaining or dwarf walls to receive the waterproofing; otherwise, if built in a bearing wall, the stepping of the wall, to permit of waterproofing.

The Integral Method, on the contrary, needs no retaining or dwarf wall, nor stepping of bearing wall. It permits of the erection of the entire substructure independently of the waterproofing contractor, who is thus at liberty to install his system without interfering with or retarding the progress of the general construction.

Strength.

Whenever the bituminous method is used, walls built over footings covered with either an asphalt or tar and felt mat must be keyed in order to prevent sliding; and on floors where the bituminous mat is laid over rough concrete the top finish must of necessity be weighted down, since the bonding of under and top beds of concrete is in this case an impossibility.

The Integral Method, which, as already noted, becomes an essential and inseparable part of the structure, therefore, cannot possibly injure; neither can it be considered a negligible quantity, neutral in effect. Its presence in the masonry must add to the strength of the general construction.

Maintenance.

Waterproofing, after all, is a form of insurance; the protection in this case being against injury and damage from water and dampness. The contractor who executes the work of waterproofing, issues, as it were, a limited policy for which he exacts one premium, the protection being only for a short period, after which the risk is transferred to the insured himself, who assumes the responsibility in the event of a leak, to provide the remedy at his own cost.



Interior of a Room Having Mosaic Tile Walls and Ceiling by American Encaustic Tiling Company.

The Bituminous Method, while supposedly as elastic as the human skin, possesses the qualities of expansion and contraction, but it sometimes expands to the breaking point. This is especially to be apprehended when settlement takes place, or in the presence of sewage or contaminated waters, when it becomes deteriorated, rots and is destroyed. In such a contingency the work of effecting repairs necessitates the getting at the hidden mat, and this cannot be done without the removal of the protecting masonry.

The Integral Method, being rigid, has some tendency to crack whenever settlement takes place; but it cannot deteriorate nor rot. Should a leak manifest itself, there need be no removing of masonry to make repairs, since the waterproofing stratum is always in view, and the cost for such repairs is so small as to be almost negligible.

Cost.

The bituminous method requires:

First. Additional excavation, or instead of this on the outside of the bearing walls, either a dwarf or retaining wall; or, if on the inside, a resistance wall must be placed.

Second. A "keying" for the footing course.

Third. An armor coat against puncturing.

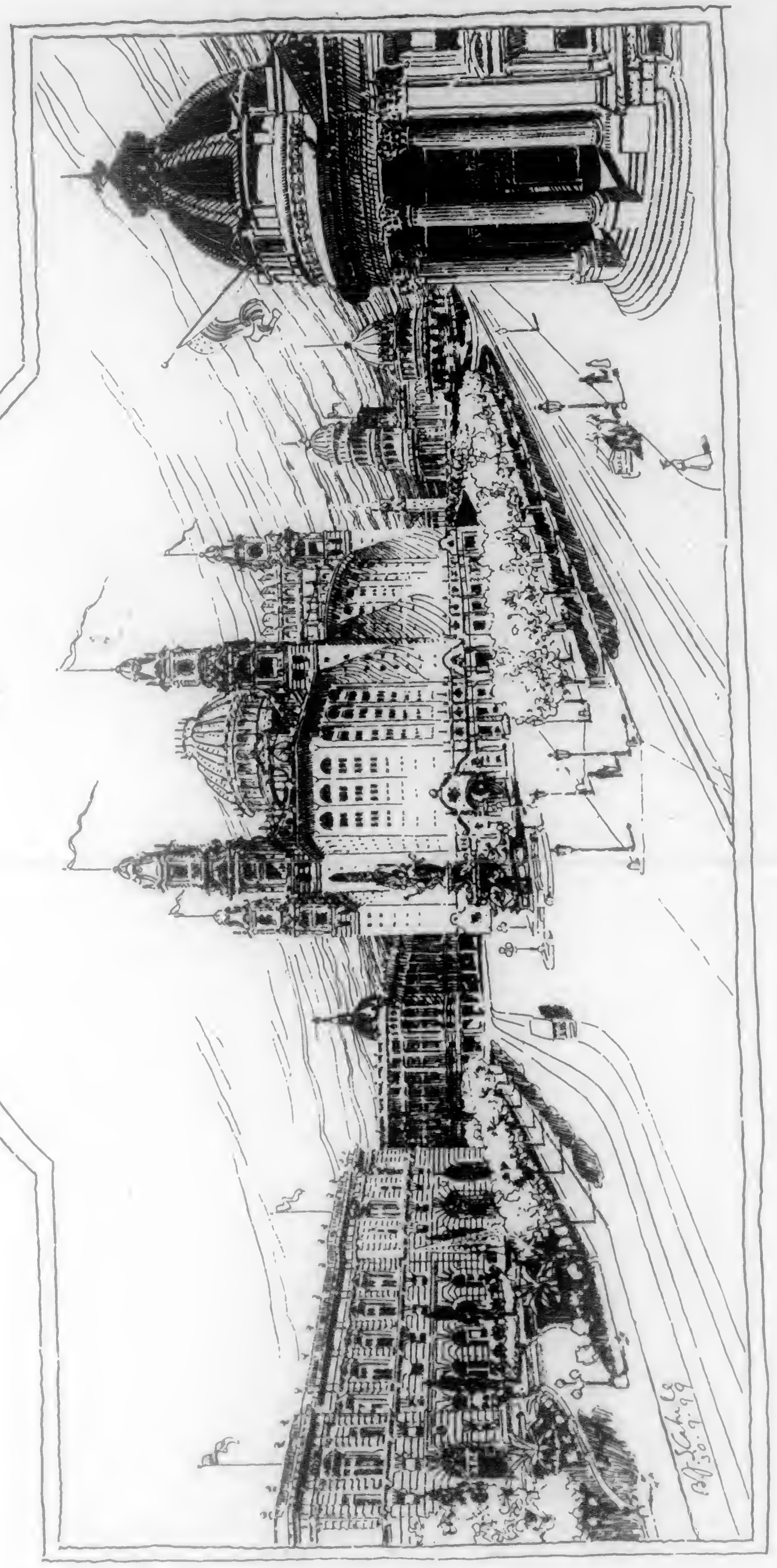
These requirements, indispensable to the bituminous method, increase the cost of waterproofing from seven to ten times.

The integral method, on the contrary, requires:

No resistance, retaining or dwarf walls.

No "keying" of footing course.

No weighted top finish.



PLAN OF 1899.

Postoffice with Park looking on to Market Street and facing Library site — Proposed Hotel, Roof Garden and Theater or other Monumental Building — City Hall on 200 foot Avenue — Mechanics' Institute and — Hibernia Bank

The Bond Issue and the Burnham Plan—A Study in "Panhandling"

By B. J. S. CAHILL, Architect.

"Beware of the man with *one* idea."—Thomas Carlyle.

IT IS safe to say that few more senseless propositions have ever been put before the voting public than the one embodied in the pending bond election. It asks, Shall the people of San Francisco sell the present City Hall site and buy another one farther up the street; or shall they not? Of course the public will decide in the negative. But this does not mean that San Francisco is adverse to sane improvements nor opposed to a rational civic center. Nor will the opportunity for these very desirable things have gone when the City Hall site is once more dedicated to its original purpose. On the contrary, the test of public opinion and the discussion provoked in definitely expressing it in favor of the old site will bring out the advantages which the old site enjoys and the splendid opportunities that inhere to it when the time comes for their realization.

For the benefit of those who have been led to believe that all the esthetic advantages are tied up with the new site and that adherence to the old one marks the Silurian, the petty economist and the old fogy; and for those devout citizens who "believe in, but do not understand," the "Burnham plan," as it is called, I offer the following considerations regarding the old and new sites from the viewpoints of sentiment, law, economy, and the Burnham plan.

SENTIMENT

Surely there is something uncivilized, even brutal, in the notion that nothing is established or permanent, that institutions of government, seats of learning and temples of faith can be changed, removed, abolished, at a moment's notice. Are we nomads, Indians or savages, that we can root up the foundations of our establishing as a Tartar tears up his tent? Our whole civilization is founded primarily on the idea of fixity and permanence.

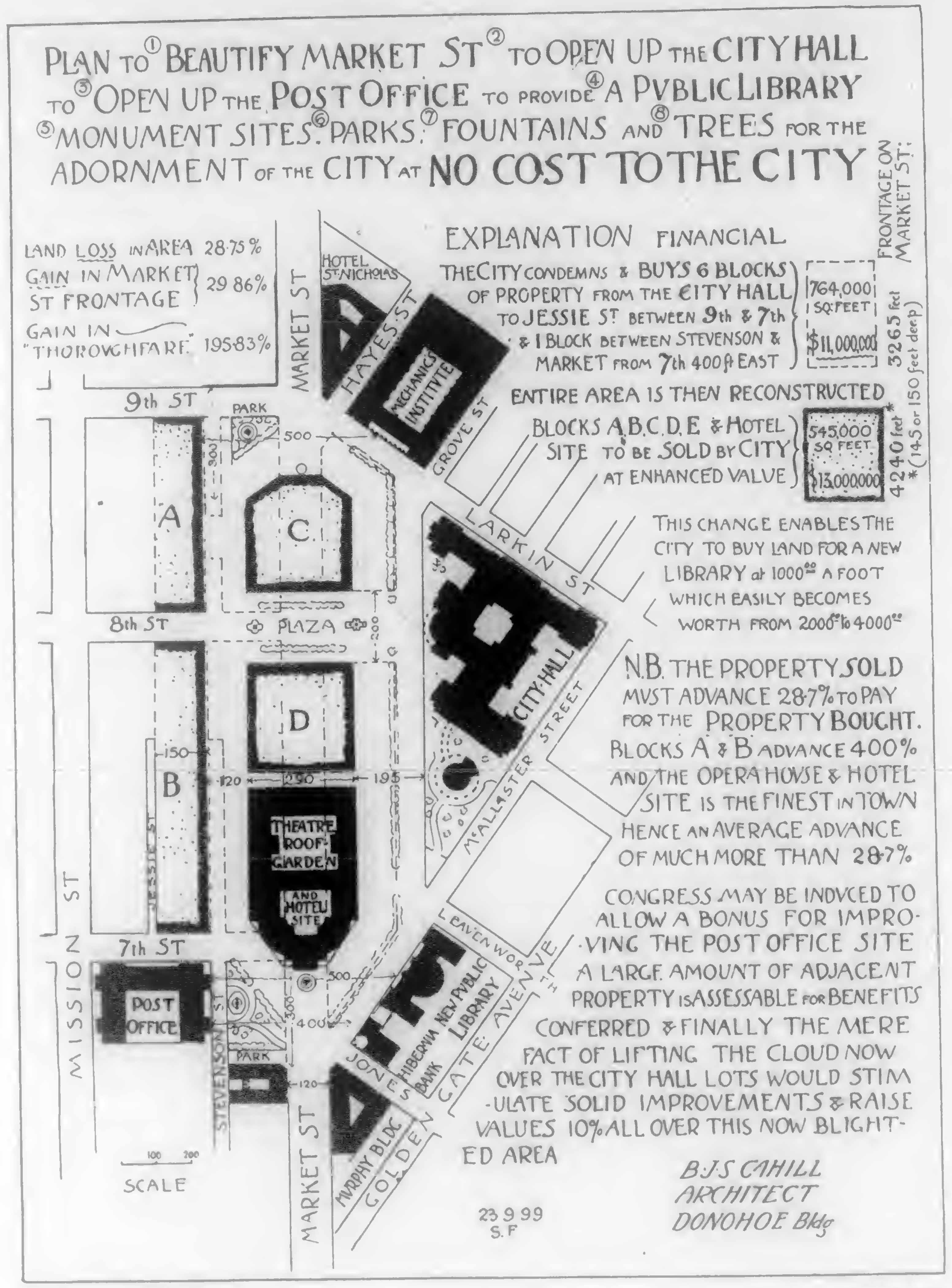
Who has not read of the excavations under way of some great building, temple, church, or palace? "Under the foundations the workmen come upon the remains of a previous building." There are cases on record where archaeologists have unearthed remains of buildings eight or nine deep. One succeeding another through long historic ages. And there is something about this permanence of purpose that is highly satisfactory and as it should be. It is one of the instincts of our civilization. We all rejoice that San Francisco is rebuilt on the old site, greater and better than before. A proposal to move over to Oakland or down to Millbrae would have been laughed to scorn. We get a similar sense of pleasure in seeing old landmarks restored, if possible. Even secular and business buildings have this character and sentiment about them calling for permanence or perpetuation. Here in San Francisco, for instance, who would not have experienced a sort of disappointment if Mr. Phelan had been forced, or worse still, persuaded to sell out the fine gore his father left him in exchange for some smaller parcels farther out Twin Peaks way?

The fine new building on the same old site is a source of pleasure for reasons of sentiment, apart from any other consideration.

THE LEGAL ASPECT

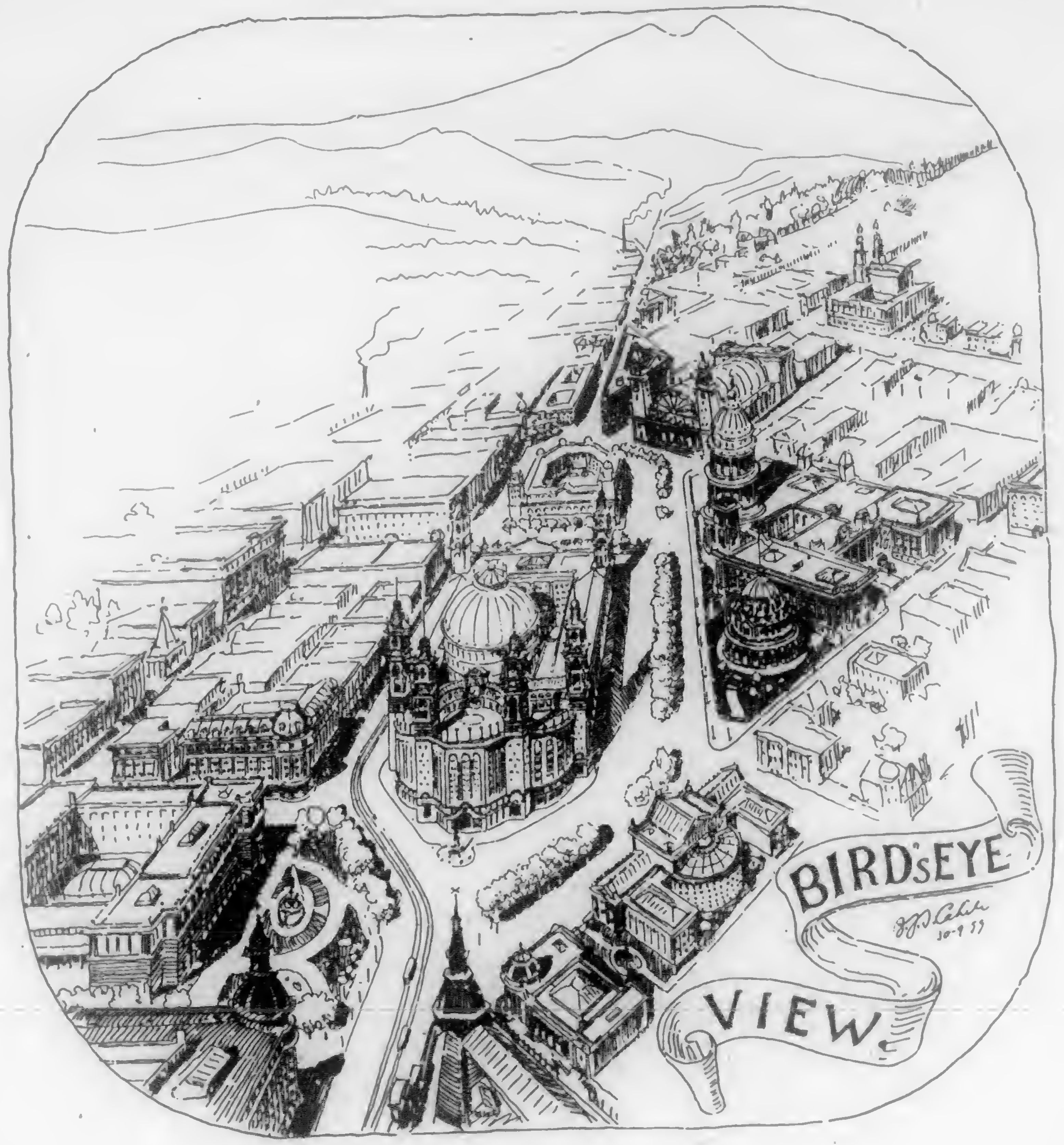
There has been much agitation all over the country of late regarding the sanctity of the law. If our great Republic is to stand, the law must be respected and upheld in places high and low, etc.

Roosevelt against Rockefeller is but a larger version of our own "Rudolph" against Ruef. In view of this wholesome agitation against law-breaking in which the principle involved is always more important than the actual malefactions, is it not a curious anomaly



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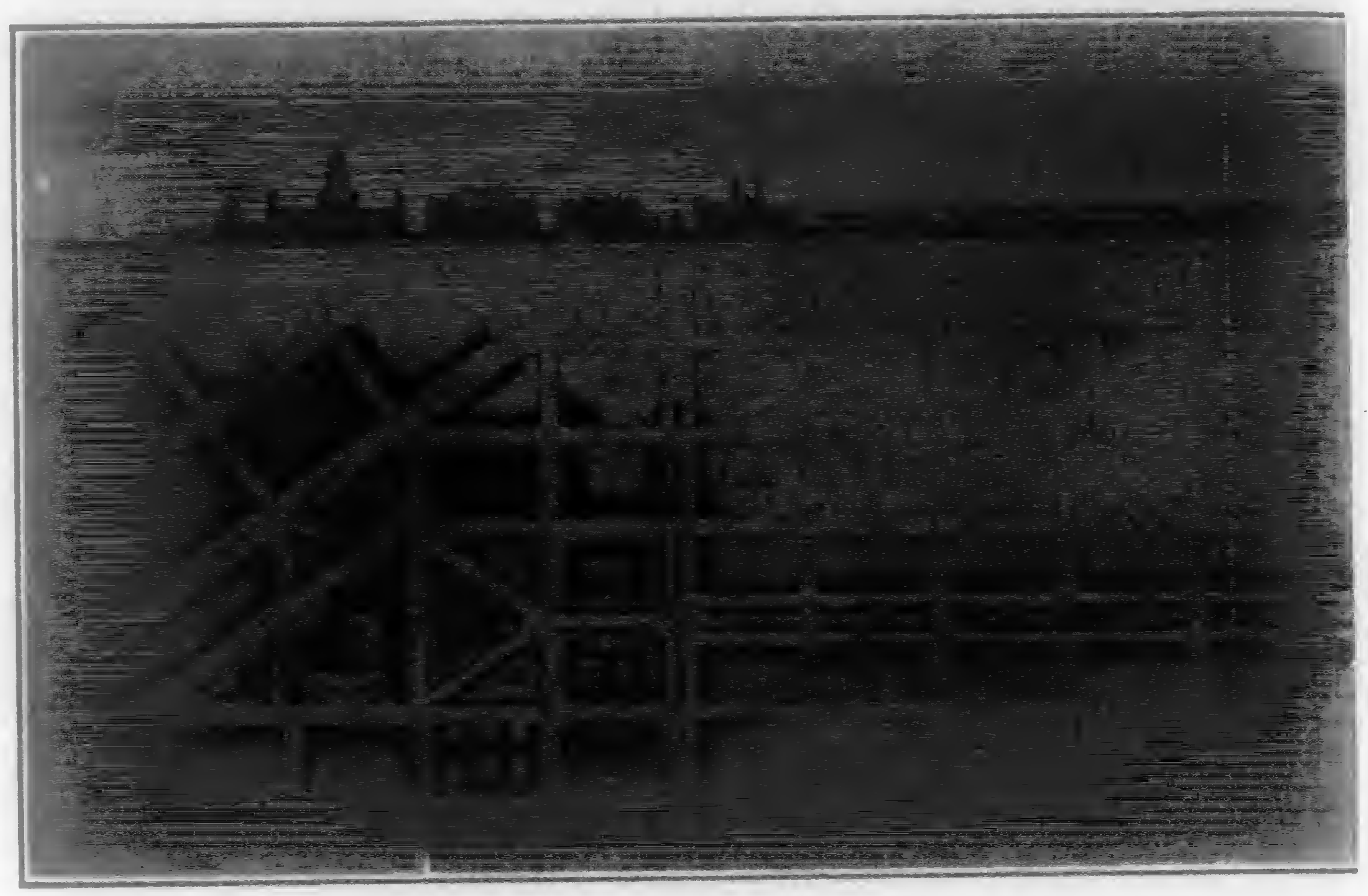
Plan of 1899.



Plan of 1899.

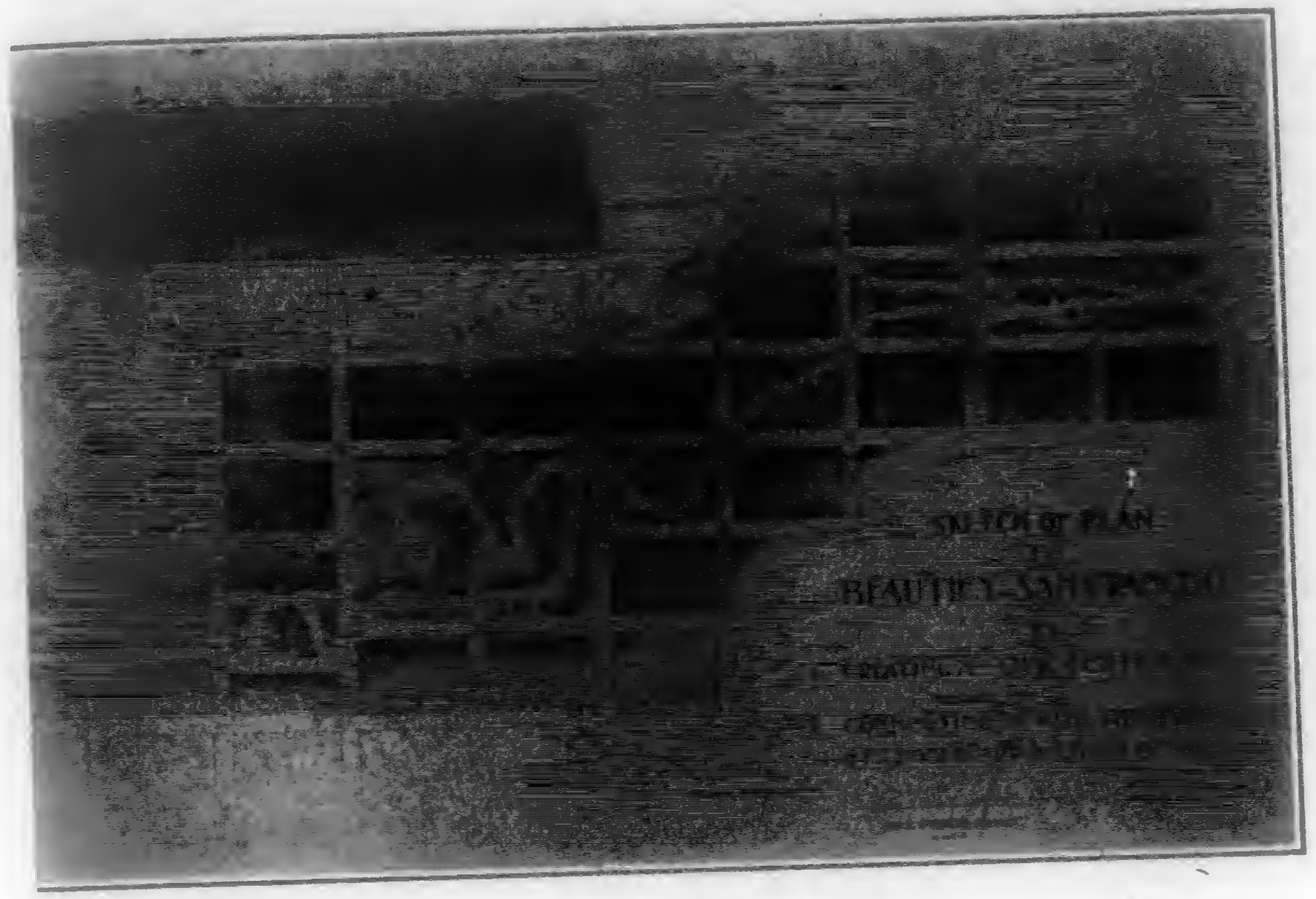
to see the same group of men spending time and money to prosecute lawbreakers with one hand while deliberately advocating law breaking with the other?

The City Hall property was originally pueblo land. For a long time used as a cemetery, it was later acquired as a park and finally dedicated by both state and municipality for the purposes of a city hall. The dedication to that end was opposed at the time by certain interested persons from the north end of town and the work of constructing the new City Hall was stopped by injunction. The consequent litigation and delay covered a period of two years. At the end of this period the dispute was ended by a decree of the Supreme Court which held that the dedication of the land for a City Hall building was "irrevocable"—there was no reservation even of the right to revoke the dedication. (Those curious to look into this decision may consult Vol. 42, page 541, Cal. Reports, 1871-72.)



Plan of 1904. No. 1.

Now what are human laws but the crystallization of customs and instincts of the nation that makes them. In this case law and sentiment both agree as they always should. As the law at best is nine-tenths racial instinct and precedent and but one-tenth legislation, it follows that we cannot unmake the law with the same ease that we make it. It is the difference of heading down or up stream. As matters stand it is plainly illegal to change the site of the City Hall. To attempt to do so without very grave and cogent reasons is to court continuous opposition and all the evils that prolonged litigation involves. It is not, moreover, the mere matter of acquiring a new site against the opposition that the project may engender. That is comparatively easy, once the money is forthcoming. The real question concerns the discarded land that we are told so glibly could be sold to help pay for the land to be acquired. How could an irresponsible municipality sell any land which is by a Supreme Court decision irrevocably dedicated for a city hall building? Real estate with an insecure title will of course always fetch a price—a strictly buyer's price. Nothing is more certain than that the City Hall property would, on account of its defective title sell for a mere tithe of its real value. It would most likely be bought in for a song, by a ring of speculators, and all solid and permanent improvements that follow on legitimate conveyancing and sound title would be witheld for a generation. One does not need a long memory to recall that the sale of the City Hall lots between Market street and City Hall avenue was followed by the same uncertainty. The cloud on the title of these lots was not so much the point as the vague feeling that the city might repurchase them for a park. For years and years hardly a building of a permanent character went up on these two blocks. Above it and below it Market street



Plan of 1904. No. 1.

flourished. Even the one large building on the opposite side of the street —Odd Fellows Hall—felt the effects of the general blight, for the building did not pay. It was owing largely to this fact that I made the plan of 1899 illustrated in the preceding pages.

Now it is said that the city pays $100,000 a year rent and that to save this rental is worth while; also that the expenditure of large sums on building will provide work for the unemployed. I should advise the advocates of the so-called civic center to forget this argument altogether, for excepting a few real estate men and lawyers, the man who is waiting for city building operations on Van Ness and Market may expect to first starve and then rot before a single pick is driven for the City Hall, if, even by any wild chance, the new site should be voted on favorably.

Attorney Charles Naylor estimates the delay in litigation at fifteen years. Those who doubt the reasonableness of this estimate are referred to the widening of Mission and Dupont streets and the creation of Montgomery avenue. The architects and draughtsmen who want to get to work on the competitive plans do not need any advice on this head.

FINANCIAL ASPECT

The financial aspect of the question has been well dealt with in the press. Californians cannot be appealed to on this score, however, with the same success as some people. Most of us have no more notion of economy than the morning sun. Personally I believe the city can afford a touch of architectural splendor, and to this very end we should keep the City Hall where it is. But it is one thing to buy what you desire and quite another to throw three or four millions of dollars away.

A million will be dropped in selling the old site with a cloud on the title and another million lost in paying the usual inflated prices for the

new land. Another half million will go to waste in the discarded foundations of the old building and still another million will be squandered by committing the city to the expensive overhill panhandle prolongation between Fell and Oak streets instead of adopting the far more economical one diagonally to Alamo Square, thence down Fulton street in a grand sweep straight to the new City Hall. (See Plan of 1904, 1 and 2.)

In any city improvement scheme a lot of money will inevitably be wasted. Wisdom lies in minimizing the chances. The City Hall property comes to us as an inheritance. To sell this compact site to buy another scattered one in several small and awkwardly shaped gores further still from the city's center would, in a private individual, be regarded as the act of a lunatic. Then why does Mr. Phelan advocate a measure for the city that he wouldn't dream of adopting for himself?

The answer is that by so doing he is making the first move toward carrying out what is called the Burnham Plan.

THE BURNHAM PLAN

Before going any further I would like to clear the ground somewhat by stating in plain language that Mr. Phelan is not merely a "prominent advocate of the Civic Center" at Van Ness and Market, but the father and mother, nurse and guardian of the whole scheme. But behind the Civic Center at Van Ness and Market, which is only a means to an end suggested by the destruction of the City Hall, lies the real goal of his desires for which he has been constantly working for at least ten years to my knowledge, and that is the overhill panhandle extension in a straight line to Van Ness avenue. The inauguration of the Adornment Society, the invitation to Mr. Burnham, the selection of the library site, and finally the scheme to sell out the City Hall and acquire a new one at Van Ness and Market—all these were engineered, manipulated or used by Mr. Phelan as stepping stones to this final consummation.

Before Mr. Bennett and Mr. Burnham were interfered with by Mr. Phelan the progress of the Burnham plan at the Twin Peaks studio did not include, and I am morally convinced never would have included those very features which now are so strenuously advocated as the convictions of a great and independent outside expert.

I know of my own proper knowledge that Mr. Phelan induced Mr. Bennett to abandon the Fulton street route to the park in favor of the Oak street route because Mr. Bennett told me so. The extraordinary overnight change of the library site was just as emphatically though indirectly the work of Mr. Phelan. The site for this building during the whole course of the Burnham plan making, was at the west of the great quadrangle facing the City Hall (see Plan of 1904, No. 1). Suddenly and mysteriously the site on the other side of Van Ness avenue between Fell and Hayes streets was put before the library trustees and passed upon and later handed up to the Board of Supervisors for final approval. At this juncture, seeing that the really first step toward realizing a part of the Burnham plan was in danger of missing fire by the action of the library trustees and supervisors, who, by the way, seem never to have heard of the Burnham plan, I, personally, as a lieutenant and co-worker of Mr. Burnham's, went down to the supervisors and with much effort succeeded in causing them to suspend judgment for a few months until Mr. Burnham should arrive from Manila. Three days before the supervisors met to hear Mr. Burnham's judgment, and to give their vote accordingly on the library site, I called at the bungalow where Mr. Burnham, in the most cordial way in the world and without the least hesitation, assured me that he still held to the first selection for the library site. When the supervisors met in full session, Mayor Schmitz in the chair, Mr. Burnham arose with a tracing made overnight in his hand, and to my utter amazement not only recommended, but emphatically recommended, the selection of the Fell street block opposite St. Ignatius' Church, and, of course, next to Mr. Phelan's proposed panhandle. The amusing part of all this is, that in the Burnham Report this very library block is shown on all the drawings pierced through the middle and almost annihilated by an enoromus boulevard running on an extension of Eleventh street, from an unlikely Union Depot to a still more improbable Opera House.

One has only to hear a Civic Center speech by Mr. Phelan to realize that with him "the panhandle is the thing." It is the climax of all his oratory. Indeed I have his own word for it. "Down in my boots," as he put it, "I have a feeling that the panhandle extension is the only thing that will really come out of this Burnham plan." And ten years ago, when I showed him my first plan (1899), although it was a scheme involving some twenty-four millions of dollars, in the purchase and sale of seven large blocks of land, Mr. Phelan characterized it as—and I remember his exact words perfectly—"an agreeable *introduction* to the panhandle extension." I am convinced that he regards the Civic Center at Van Ness, the library, City Hall with the depot opposite, and all the rest, as an agreeable "*introduction* to the panhandle!"

No one can object to Mr. Phelan booming his panhandle, although I think he goes much too far when he tries to make us move the City Hall unwisely and illegally, and spoil the business future of upper Market street just to make *sure* that we shall extend this everlasting panhandle and nail it to the map.

In spite of this apparent monomania, I remember Mr. Phelan once writing me in a letter that "he was not wedded to the panhandle." It may be there is no marriage certificate in the case—none the less he does not seem able to espouse any other route such as the one herewith, for example (Plan of 1904, Nos. 1 and 2). Mr. Burnham was enthusiastic about it, if I am to believe the secretary of the Adornment Society; he even went so far as to acknowledge openly that it was the best idea that had been submitted to him. He adopted it immediately and Mr. Bennett worked on it among the first things he did in the famous bungalow. But Mr. Phelan was critical. He made the same erroneous use of the words cul-de-sac and *impasse* that I heard him use recently at the Commonwealth Club. He wrote me from New York that the Fulton street boulevard (see Plan No. 1 of 1904) ended in a cul-de-sac at the City Hall. In this sense of course the Avenue de l'Opera is a cul-de-sac, the Champs Elysees an *impasse* at the Place de l'Etoile, and Fleet street where it meets St. Paul's is a "blind alley, and of course Market street is an *impasse* at the ferry.

Having realized that the much-invoked Burnham plan is really the Phelan plan—as regards the civic center—we can now discuss its merits without any preconceived notions that because it is Burnham's it is beyond criticism.

What advantages has the Civic Center at Market and Van Ness over the original Civic Center in the west facade of the City Hall, and what is a *Civic Center* anyway?

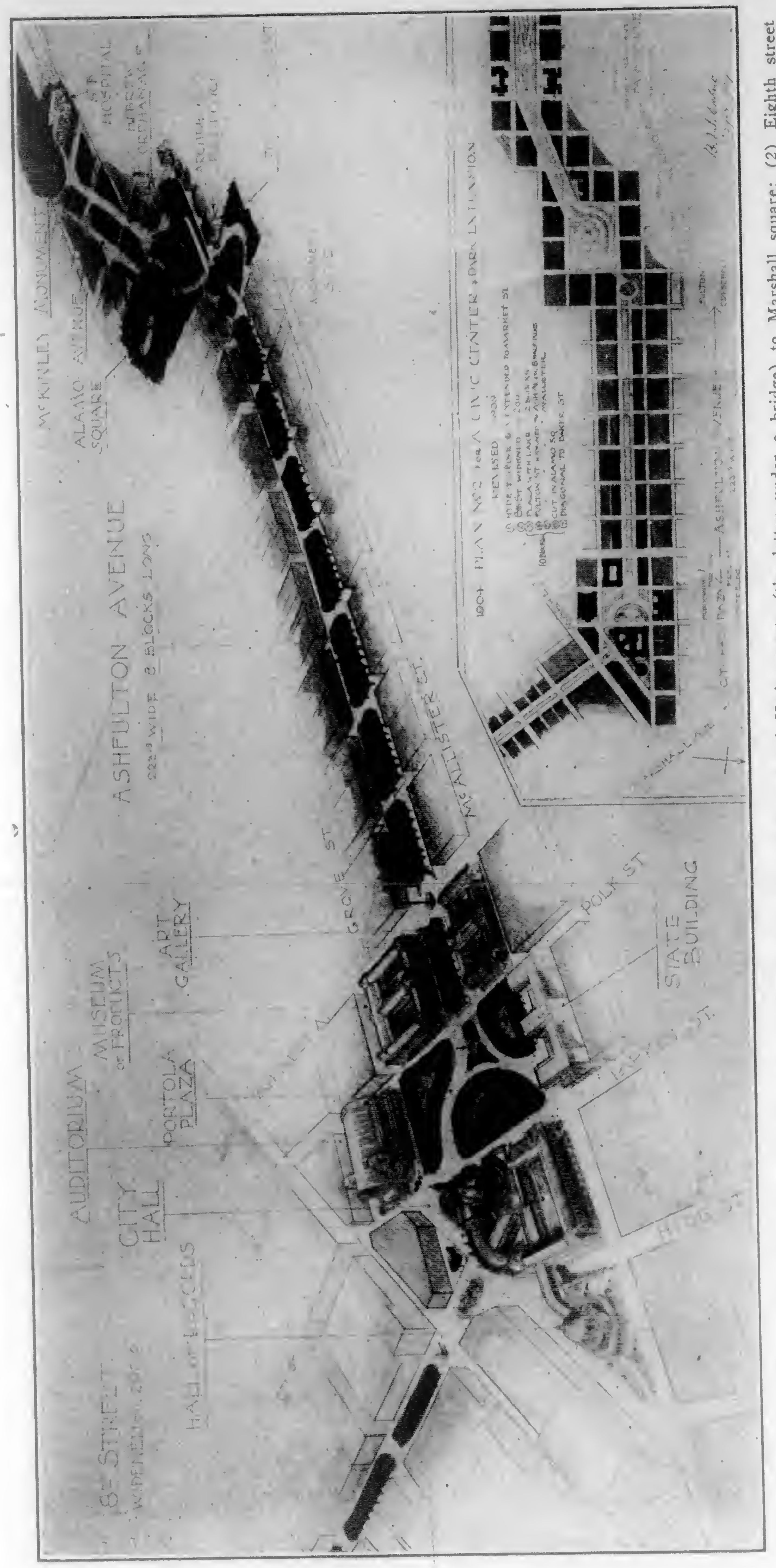
This morning I received a letter which I quote in part:

Warner, Wells & Korb,
Counsellors-at-Law, 60 Wall street, New York. May 27, 1909.

Dear Mr. Cahill—

I am writing Reform Club office to send you a couple of copies of the March 1902 number of "Municipal Affairs." . . . .

As to your query, I am the originator of the phrase "Civic Center," in the ...



PLAN OF 1904 No. 2; REVISED 1909. It advocates: (1) the extension of Grove and Hyde streets (the latter under a bridge) to Marshall square; (2) Eighth street widened to 200 feet; (3) Portola Plaza, with lake, two blocks facing City Hall; (4) Ashfulton avenue on the western axis of the City Hall between Ash and Fulton, 223 feet 9 inches in all, carried as far as Fillmore street; (4) Fillmore crescent with monument site, one block; (5) a cut at edge of Alamo square; (6) a boulevard to the panhandle and McKinley monument, three blocks diagonally. Total, ten blocks, excluding Eighth street and Marshall square widening. Maximum grade 4 per cent.

sense that I know of no one having used it before. Am rather confirmed in its novelty by extent to which, as I recall, it was ironically quoted and commented upon by sundry critics who credited (or debited) it to me,

Sincerely,
JOHN DE WITT WARNER.

The magazine alluded to contained an article by Mr. Warner entitled "Civic Centers." It was a description of those parts of all great cities where the life and culture of the community find its grandest monumental expression usually in an aggregation of buildings grouped more or less formally about an open space—the buildings and the space always bearing some harmonic relation to each other—the whole scheme generally remote from and unrelated to the arteries of trade and commerce. Mr. Warner's article began by describing the Civic Centers of the past—the Acropolis of Athens and the Roman Forum. Then he touched on the Place-de-la-Concorde and vicinity, and Trafalgar square. Finally he reviewed various schemes afoot for remodeling the cities of America. The very first one mentioned was "Mr. Cahill's Plan for San Francisco"—that of 1899. He then spoke of schemes for Cleveland, Chicago and finally Washington.

In the plan of 1904, made at the suggestion of Mr. Thos. McCaleb, secretary of the "Adornment Society," I used the phrase Civic Center for the first time. The scheme and the phrase were both adopted by Mr. Burnham and acknowledged by him in his report, but the scheme was gradually worked out and only the phrase left.

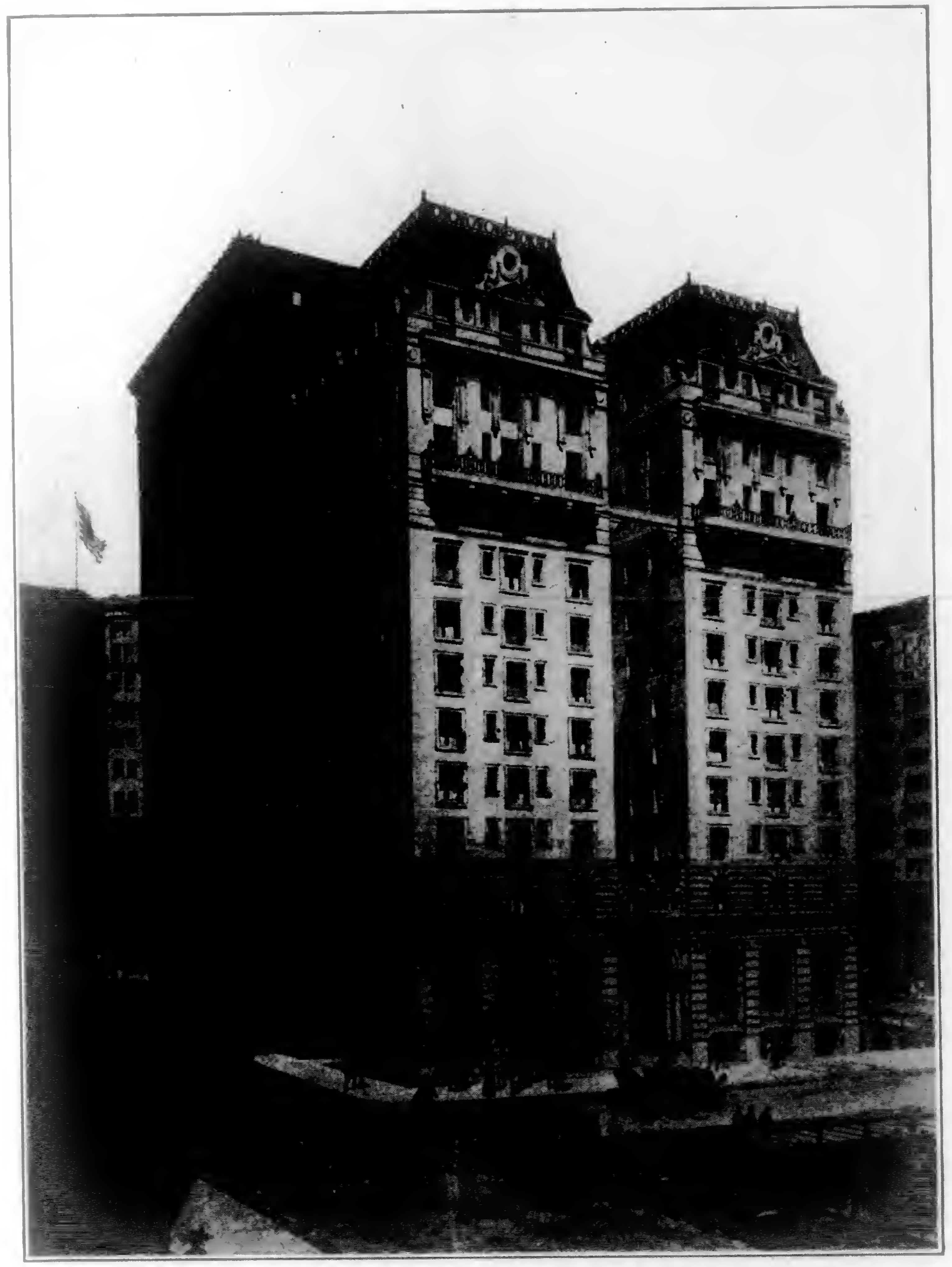
Thus it will be seen that my proposed plan of 1899 was the first on record to be described as a Civic Center by the author of the phrase, and the plan of 1904, the first styling itself a "Civic Center." The Burnham report construes the phrase "Civic Center" erroneously as a point or space rather than as a nucleus of monumental buildings in visible proximity.

From this digression I come back to the discussion of the merits of the two sites. When Mr. McCaleb first suggested my making a plan to be submitted to Mr. Burnham he gave it out somewhat as a "tip from the higher ups" that Market and Van Ness was to be the focus of the Civic Center, which was to be dominated by an Auditorium talked of by the Law brothers I believe. I at once made a plan almost identical with the one now before the public—with a semicircle facing Eleventh street, radiating spokes and all. But the awkward angle at which the streets meet, the need of blocking up dedicated thoroughfares (a thing I had learned to avoid), the utter lack of any buildings of monumental character to help out the Auditorium—itself highly problematical—and the sin against the first commandment of city planning—putting a plaza of repose on an artery of action—all these things made for complication and failure.

Added to this was the fact that the panhandle overhill extension did not commend itself. It lacked intelligence. It suggested too much the Czar Nicholas and his ruler railway from Moscow to St. Petersburg. Why carry a park a block wide over a rocky hill where trees get all the wind they don't want and so little of the moisture they do want? Why go a route demanding deep cuts and expensive grading which runs over much valuable and established property and leads nowhere when there is an available way through a poor district with the minimum of hill climbing and the maximum of shelter—in which much less property is needed and which leads magnificently to the dome of the City Hall and the great Portola plaza about which in due time some of the city's beautiful and

monumental buildings can be so superbly grouped, two of which, the City Hall and the Auditorium are already guaranteed. Had Mr. Burnham been let alone we should have had a third side of the superb quadrangle dedicated to a monumental structure—the library.

In conclusion I submit, seeing that city land deals are on the tapis, that the library site recently acquired be sold or exchanged for any of the three blocks around the proposed plaza—a far more sensible real estate deal than the outlandish one now thrust before the voter, and much more worthy to succeed.



Design for Grand Hotel, San Francisco.
Wright, Rushforth & Cahill, Architects.

Hearing of the Charges Against the San Francisco Board of Public Works

By MILTON T. U'REN.

OWING to the technical nature of the recent inquiry before Mayor Taylor concerning the construction of the Infirmary building in San Francisco, those who did not attend the hearings in person were not able to get a clear idea of the issue involved. In order to clear up what misconceptions there may be, I have been asked by the editor of this magazine to write a short article explaining the issue involved.

The Good Government League of San Francisco was informed early in 1907 that the reinforced concrete buildings which were being erected for the city were not being constructed strictly in accordance with the plans and specifications, and also violated certain building ordinances of the city and county. The league at that time was so situated that it was impossible to go into the matter thoroughly, and therefore did no more than to direct a communication to the Mayor and to the then Board of Public Works, calling their attention to the matter. In February, 1909, the league was informed that the plans and specifications regarding the reinforcing of the floor slabs in the county infirmary building, located on the almshouse tract, were being violated in that, whereas the plans and specifications called for reinforcing material of 65,000 pounds' elastic limit and sectional area of .186, the material actually being put into the building had an elastic limit of about 35,000 pounds and a sectional area of .087.

The league appointed a special committee to investigate the matter and the committee laid the facts before his Honor, the Mayor, and also directed a communication to the Board of Public Works. The board held a conference with the committee of the league and the matter was gone into thoroughly and the position of the league made plain. At that meeting Mr. Jubb, an engineer who had been consulted by Mr. Tharp in the drawings of the plans and construction of the infirmary, contended that the clause in the specifications reading as follows, "Electric welded or other drawn wire fabric may be used, provided equal strength is obtained," gave the contractors the privilege of using the Clinton wire mesh, which was being placed in the floors. John B. Leonard, the consulting engineer, appeared at that meeting on behalf of the league and contended that equal strength was not obtained, owing to the fact that the reinforcing material being put into the floors had only about 60 per cent of the elastic limit and only about 48 per cent of the sectional area of that called for in the rod design set forth in the plans and specifications.

The Good Government League committee left the meeting with the understanding that a comparative test of the two floor slab designs would be made by the Board of Public Works, in order to determine whether or not the contractors were following the plans and specifications. Subsequently the league received a letter from President Day of the Board of Public Works, stating that he would see that the plans and specifications were strictly followed. About one month after this meeting the Board of Works had a test made by Loren E. Hunt, the engineer, but who at the request of President Day made a test only of the strength of the floor slabs, as constructed with the Clinton mesh, and did not make a comparative test. This test showed that the floor slabs as being constructed were of sufficient strength to come up to all requirements of the city ordinances.

Comparative Test Not Made.

The Good Government League, upon hearing the result of this test, determined that as the strength of the floor was not the issue raised by them

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before the Board of Public Works, and as their request for a comparative test had been ignored by the board, the league would bring the matter to the attention of the Mayor in such a manner as to compel a determination of whether or not the slabs, as being constructed, were as strong as if constructed with the rod design, strictly according to the plans and specifications.

A committee was thereupon appointed, consisting of Mr. Isidor Jacobs, Rev. C. N. Lathrop and the writer. Charges were formulated against the board and filed with the Mayor. The Mayor thereupon notified the Board of Public Works that they would have to explain their conduct before him in an official investigation.

The trial of the Board of Public Works consumed several days. At the outset the league made its position plain, to-wit, that it charged that the floor slabs as being constructed were not as strong as if constructed according to the rod design as set forth in the plans and specifications. Commissioner Day admitted immediately that the Clinton fabric, which was being used in reinforcing the floor slabs, had an elastic limit of less than 40,000 pounds and a sectional area of only .087. He at first contended that the Board of Public Works had the right, under the clause of the specifications allowing it to alter or modify the contract, to permit the use of this material. Under cross-examination he admitted that the contract had never been altered in any way. The contract was then put in evidence and it was shown that the plans and specifications as bid upon had never been altered either by the City Architect or by the Board of Public Works. This defense was thereupon abandoned and the defense offered by the contractors, Condon & McGlynn, to-wit, that they had the right to use Clinton mesh, "provided equal strength was obtained," was adopted by the board.

Rod Design the Strongest.

The complainants put on several expert witnesses and each of them gave it as his opinion that the floor slabs as being constructed were not as strong as the floor slabs constructed of rod design, according to the plans and specifications. Professor Charles Derleth, Jr., head of the College of Civil Engineering of the University of California, was the first expert witness called on behalf of the complainants, and was asked the following question:

"Consider two slabs, 'A' and 'B,' 'A' of rod design as described in the specifications and shown by the plans of the City Architect, elastic limit 65,000 pounds, area of steel section .186;

"'B,' same slab, replacing the rod design by a wire fabric, elastic limit less than 40,000 pounds, area of metal section .087. Which slab, in your judgment, is the stronger and safer design for construction?" The answer was, "The slab 'A' would be much stronger—just how much it is hard to say." This question was then asked:

"In the slabs 'A' and 'B' the fabric presents practically one-half as much steel as the rod design. In 'A' if the bars which run straight through are removed, to-wit, every other bar, you would still have in the bar design practically the same amount of steel as in the fabric plan 'B,' and essentially in the same position. Would not this rod slab, with only one-half as much steel as that specified, be of the same strength as the fabric design 'B?'" (Explanation: It should be stated that the plans called for three-eighth inch rods at nine-inch centers, every other rod going up over the beam and every other rod running straight through, every alternative rod being securely fastened to a cross rod with wire at intervals of about three feet; slab, three inches thick.) The answer to this question was that if the rods running straight through were removed, the rods would be at eighteen-inch centers, which would be too far apart, and that therefore the design was impracticable, and

that the witness did not consider it a safe design. He was then asked the following question:

"Suppose that the rods were one-half the size of those specified, placed nine-inch centers and every rod running up over the beam: would this rod design be as strong as the fabric design 'B,' noting that you have only one-half as much steel in this design as that specified in design 'A'?" The answer was that this design would be as strong as the design "B."

The same series of questions were put to Professor Wing of Stanford University and John Little of the engineering firm of Barker, Hall & Little, and the same answers were given.

It will be seen that if only the strength secured by using the wire fabric was demanded by the City Architect, it could be secured by using one-half the amount of rods specified in the plans and specifications, if the requirements were properly drawn.

About the Fabric Design.

Testimony was given by Mr. S. A. Jubb and by Loren E. Hunt to the effect that the floor slabs as being constructed with Clinton fabric were as strong as if constructed according to the rod design specified in the plans and specifications. Mr. Jubb under direct examination of attorney for the contractors at first hesitated to give this opinion, and stated that the floor slabs as being constructed responded to his idea when he drew the plans and specifications. Under cross-examination and when pressed directly for an answer he stated that the fabric design was approximately as strong as the rod design. When questioned concerning the requirements of formulae set forth in the text-book, Mr. Jubb stated that these formulae would not apply to wire reinforcement. He further stated in the course of his examination that he had not figured out the sectional area nor had a test made to determine the elastic limit of the Clinton fabric, before he recommended it for use in the building.

Mr. Hunt's testimony did not vary very much from that of Mr. Jubb, although he stated that in his opinion the formulae applied as much to wire as to rods, but that he did not believe that they applied to either. It was his opinion that the formulae laid down in the text-books were wrong, as to slabs. This was practically all the expert testimony offered on either side.

There is another matter which came up during the course of the trial and which I must refer to here for the purpose of doing justice to two gentlemen who have always stood for what is right: That is the attack upon General Backus and John D. Leonard by the attorney for the contractors. It was stated by this attorney in his final argument that Mr. Leonard had admitted that he had placed bars for which he is the agent, in buildings which he had constructed, unknown to the owners thereof. This is not so. Although the attorney made many efforts to get Mr. Leonard to make this statement, Mr. Leonard under redirect examination declared positively that he had never placed these bars in buildings which he had constructed, without the full knowledge and consent and at the request of the owners. The testimony further shows that the provisions for reinforcing the floors with carbon bars was placed in the plans and specifications, not at the request of General Backus, as alleged by the attorney for the contractors, but at the request of at least half a dozen carbon bar agents, the witness mentioning in particular the Judson Iron Works.

Personal Attack Uncalled For.

The Good Government League has felt keenly this attack on General Backus and Mr. Leonard and has adopted resolutions denouncing the attack

and expressing its utmost confidence and faith in both of these gentlemen. There was considerable other evidence showing bad faith on the part of the Board of Public Works toward the Good Government League. As my space is limited, I cannot go into all of this evidence, but sufficient to say that a comparative test was promised at all times, but was never made, and no sufficient excuse given.

The most important piece of evidence is that of N. J. Tharp, the late City Architect. Mr. Tharp, commencing on March 10, 1909, and after he began to investigate the matter of reinforcement, sent several letters to the contractors, declaring that they were not using the proper rèinforcing material, and directing them to do so. The requests in these letters were not heeded by the contractors, and they continued to use the same reinforcing material. On April 9, 1909, Mr. Tharp presented his written report to the Board of Public Works, in which he stated very emphatically that the contractors were using a reinforcing material of only half the value of that specified, and called upon the board to rescind the contract. This report has already been published in this magazine. It would be well for each reader to get the last issue and read it. The specifications provide that in case any dispute arose concerning the construction of any of the terms of the specifications, or of the plans, the City Architect should act as sole arbitrator and that his decision should be final and conclusive. This provision became a part of the contract.

It seems to me that the determination of the City Architect as to what was proper reinforcing material should have been final and the Board of Public Works should not have overruled Mr. Tharp unless they did so under the power given them to alter the contract, which was never done, according to the testimony of President Day.

It therefore seems conclusive to us that the reinforcing of the floors of the county infirmary building was not done according to the plans and specifications, and that the board has been guilty of willful neglect in permitting the use of the Clinton fabric of the size and mesh used by the contractors, to-wit, No. 6 wire, 4x12 mesh; that the question of motives raised by the attorney for the contractors was one raised for the deliberate purpose of making a false issue, and not to aid the Mayor in determining what was the proper reinforcing material. It is needless to point out the danger that is attendant upon these practices, nor how easy it would be to perpetrate frauds upon the city, and how wide open the door would be flung to fraud, if it is determined that these contractors were within their rights in using this material.

* * *

Out of Pocket

A young man, who had been arrested for speeding his auto through a small town near San Francisco, was up before the judge, who was well known for his strict enforcement of the "unwritten law."

He pleaded guilty and the judge said: "Young man, I shall have to make an example of you and fine you fifty dollars. And"—

Young Man (hastily)—Oh, I've got that in my pocket!

Judge—And thirty days. Have you got that in your pocket?—Judge.

It's usually the loud talker who is getting the short end of the argument.



Residence of Mr. W. T. White, Oakland, California. Bakewell & Brown, Architects.



Paneled Entrance of California Marble in the Kittle Building, San Francisco, Furnished by the Baxter Marble Company.

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* * *

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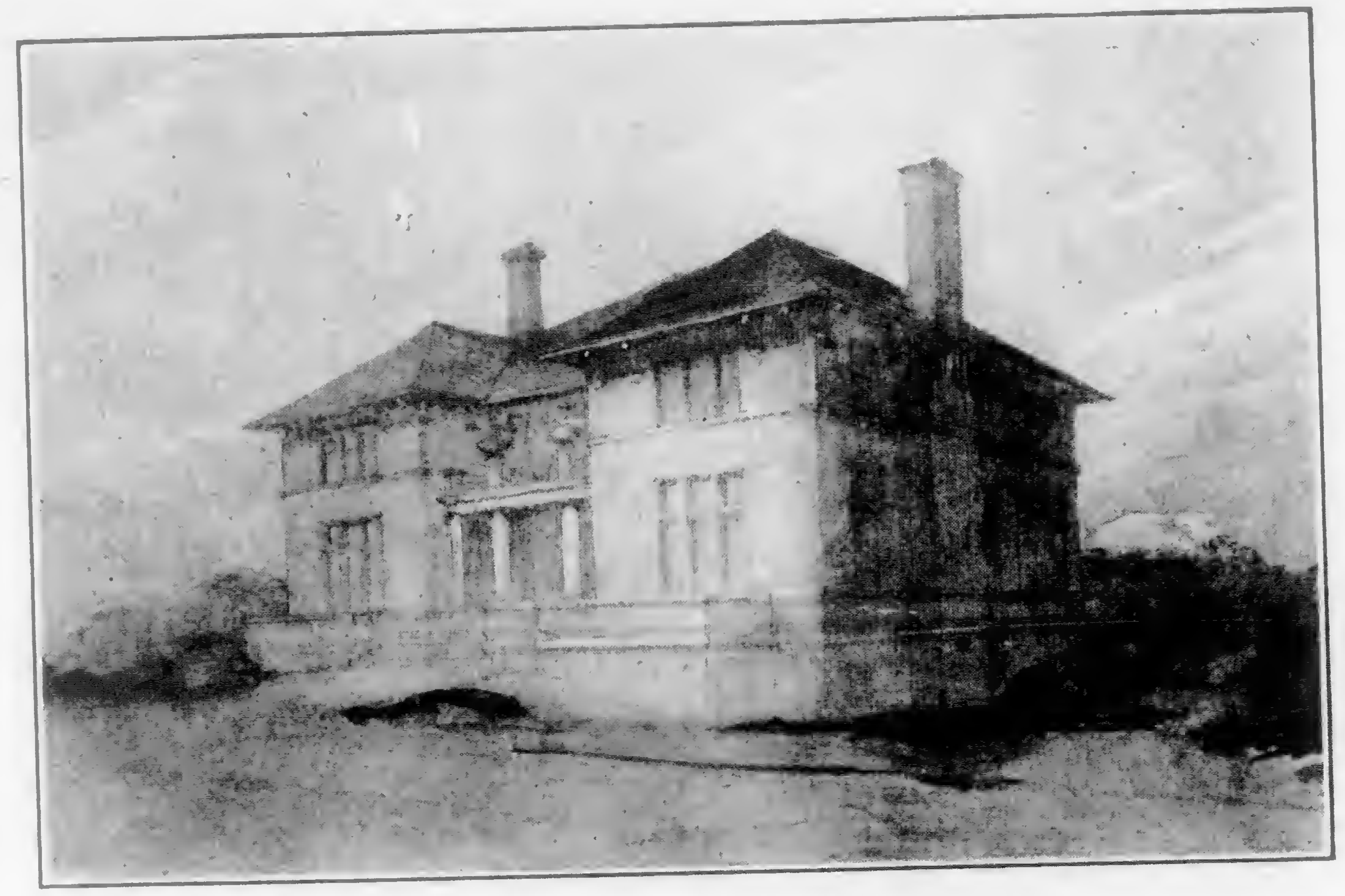
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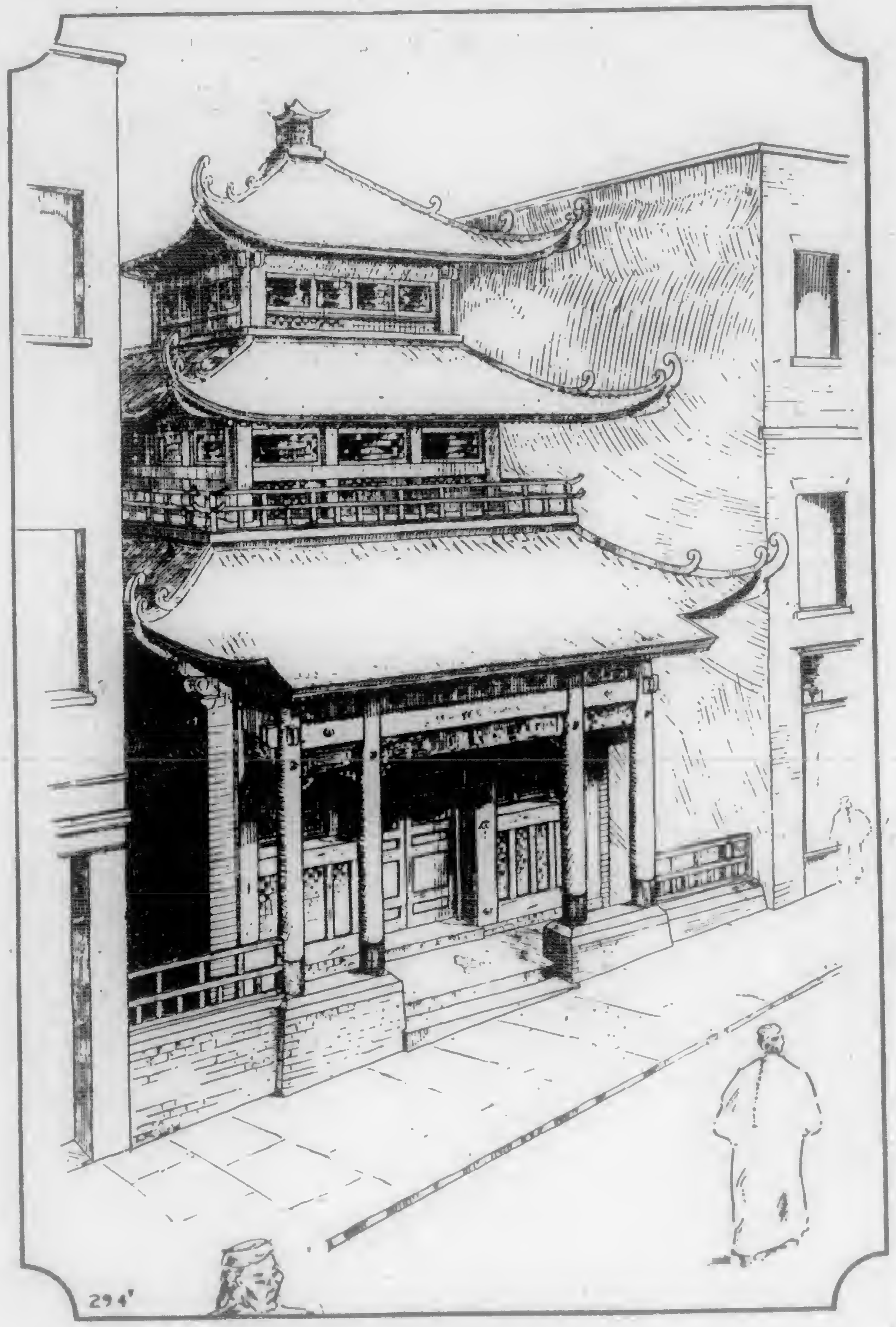
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Residence of Mr. W. T. White, Oakland, California. Bakewell & Brown, Architects.



Paneled Entrance of California Marble in the Kittle Building, San Francisco, Furnished by the Baxter Marble Company.



Oriental Telephone Exchange Building in San Francisco's Chinatown.

Title and General Conditions of Building Specifications*

By ROBERT MORGENEIER, Architect and Engineer.

THE title, general conditions and text of a building specification constitute one instrument.

The title and general conditions are as important as the directive text or main body of the specifications. Consequently, they should be drawn with the same care.

The function of the title is to clearly and concisely mention the thing or things to be done and to be furnished, to state where the structure is to be erected and for whom.

The most elaborate specifications can and should consist only of an orderly enumeration and description of materials and of workmanship to be employed in combining such materials, so that in the end a building as shown on the accompanying drawings may result. Therefore the title should in its first clause read: Specifications of labor, materials and workmanship to be used and employed in the erection and completion of a (here briefly describe the kind of building, for example, "six-story reinforced concrete metal roofed store and office building").

The second clause stating where the building is to be located, shall by metes and bounds describe the land and then specify what part of said land the building shall occupy.

In cities, and particularly in the business districts, where the building walls abut public easements, for example, sidewalk lines, and the boundary lines of adjacent property, the prescription should be a copy of the survey by an able civil engineer.

If any boundary line is in doubt or is contested, the architect shall look to the owner for a description, such description by owner to be in writing. If then encroachment should be subsequently shown, the architect can not be held responsible. When the area of the land to be built upon exceeds the ground floor end of the proposed building and no wall or other part abuts a boundary line, then the location may be described by lot and block number, of which the following is an example, "To be situated on lot No. 10 of block No. 20, of Smith's addition, being on the east side of Twenty-ninth Street, between Seventh and Eighth Avenues, City of Oakland, Alameda County, Cal." The third clause of title shall name the owner.

It is not enough to say "For Mr. So and So," as is often done. Ascertain and specify the full name and place of residence of such owner, for immediately the building is started, the owner and his place of residence is of importance.

The most meager and still admissible description shall state name, city, county and state, to-wit: "For Mr. Wm. F. Jones, of Oakland, Alameda County, California."

General Conditions.

The essence of the general conditions preceding the directive part of a building specification consists in an effort to fix the respective positions, duty, rights and liabilities of the parties at interest, viz.: The owner, the architect and the contractor, and these may be condensed to the following:

The owner shall pay for the work done and accepted, shall have dealing with the architect only and not with the contractor; can personally examine and observe the operations, but shall not give orders or direct the contractor, and becomes liable should he do this.

*Fourth of a series of articles on "The Law Regulating the Practice of Architecture."

The architect shall furnish all the information required to direct the contractor, such information to be by means of writings, drawings, and personal superintendency, but he shall not direct the contractor *how* to do the work.

He shall observe all the operations and their progress, and acquaint himself with the accumulative cost of the operations.

He shall construe the drawings and specifications, issue certificates for payments to contractor.

Shall finally advise owner of completion of contract.

The contractor shall erect the building of the materials and agreeable to the plan and specifications, and he shall not be expected to do anything not shown or not described, except things too minute for detailing and yet necessarily a part and parcel of the construction, or without which the utility of some part described would be destroyed or become inadequate. He shall be entitled to prompt payment for work done.

To lawfully cover and define these various propositions, and thereafter to discuss some things ex parte, I submitted the following condensed form:

"General Conditions:

"All portions of the hereinafter described work to be done in strict accordance with the drawings prepared for the same by .... duly certificated architect under the laws of the State of ...., and under his sole direction, supervision and control.

"All the materials required to be furnished by the contractor, of the specified quality and kind.

"The directive specifications hereafter following and the drawing mentioned above are assumed to be illustrative one of the other, and the part or parts shown in one is mentioned directly or constructively in the other; it is, however, understood that if by reason of inadvertance or mistake lesser but necessary parts pertaining to the utility or safety of the building or its fixed equipment are not shown or described, they shall be furnished, notwithstanding.

"The detailed drawings furnished the contractor are illustrative only of parts shown fully or in rudimentary outline on the general plans, and all work shall be carried out by the contractor in accordance with such details.

"The contractor or capable assistant shall measure and lay out all work and give it constant and careful supervision to completion.

"The work shall at all times be under competent supervision on part of the contractor.

"Sub-contracting of any part of the work shall be done only with the approval and consent of the architect.

"The work shall only be done by men skilled in the particular craft to which such work may belong, and any artisan observed to be unskilled or incompetent by the architect, shall upon his orders be removed from the work by the contractor.

"Any damaged work shall be restored to the satisfaction of the architect or entirely removed and replaced by new work acceptable to the architect.

"The architect and the owner shall have access to the work at all times and the contractor shall do nothing which will prevent inspection of such work.

"All drawings used by the contractor shall be returned to the architect, and if he fails to so return them he shall pay the cost of duplicating the same, such cost to be deducted from the final payment due him.

"The architect shall interpret the meaning of any part of the specifications about which a misunderstanding may arise.

"Payments made to the contractor are not to be construed as acceptance of work done, every part of the work to come under a final examination and only accepted as satisfactory when the entire work is completed.

"The architect may cause to be removed at any time before the final acceptance of work any part or parts not complying with the specifications and drawings, or either of them.

"Or in event that the removal would cause excessive damage to other parts and the difference or defect is not destructive of the utility and safety of the part, or of the whole, or not an architectural blemish readily observable, then the architect may deduct from the contract price any sum that, in his judgment, shall be just, as an offset to the injury and loss sustained by the owner because of such objectionable feature or features.

"The case of any additions to, omissions from or alterations of the plans during the progress of the work, such shall be conceded to by the contractor and carried into effect without in any way impairing any contract which may have been made for furnishing materials and doing the work hereinafter specified, but in all such cases a memorandum contract shall be entered into between the owner and the contractor, setting forth the changes, omission or alterations and fixing the value or cost thereof and what compensation, if any, shall be paid the contractor in addition to the contract amount for the entire work. The architect shall cause such additional contract to be recorded and a copy thereof delivered to the bondsman or bondsmen of the contractor.

"The architect shall have full power to cause the work to be hastened when unreasonably delayed or stopped, and in default of compliance by the contractor with the terms of a notice to that effect within forty-eight hours of the service of same, the architect shall notify the contractor's bondsmen of such default and also have full power to enter the premises, stop all work being done by said contractor and exclude him from the premises, furnish all materials necessary, or to use the materials then on the premises, to employ any other contractor, craftsman, builder or workman, to finish such work as may then remain unperformed or unfinished, and charge the costs therefor to the original contractor, together with all other costs arising because of such change, and to have full power to collect and retain the amount of such cost and expenses out of any money then due or that may become due to the said first contractor.

"The contractor shall be responsible for all damages that may result to any person and from any cause whatsoever, during the process of carrying on the work and to the final completion thereof.

"The contractor shall apply for all permits, except the first general building permits, notify examiners and inspectors and otherwise comply with all ordinances, laws and regulations made and provided.

"Under owner is understood.............................residing in .... County of .... State of ....

"Under architect is understood...................whose place of business is at ....City of............... County ....

"Under contractor is understood any individual members of a co-partnership, or any corporation entering into a contract with said owner for the furnishing of any or all of the labor and materials entering into the construction of the building herein considered."

Referring to the foregoing it will be seen that superintending is all that is required of the architect, and consequently that is his only lienable claim, if he has not been paid for his plan and specifications, studies, etc., he should not fall into the error of believing that such changes are lienable. Lienable, however, are all materials and all labor which can be followed into the building, by the parties supplying the contractor.

No contract can cover things not specified, therefore it is useless to contract, as is sometimes done, that "the following specifications and drawings

above mentioned are intended to correspond and be illustrative of each other and any part of the work that may be only mentioned in the one or represented in the other, is to be done as if it had been both described and represented, and should anything afterwards appear to have been omitted in both, which is usual or necessary for the construction or completion of this class of building, it shall be furnished or executed by the contractor the same as if shown in the drawings or described in the specifications."

This sort of clause is an admission on part of the architect that his work is or may be defective and justly places him under suspicion of attempting to punish the contractor by inflicting a loss upon him.

Another equally objectionable clause sometimes found under "General Conditions" recites that if the specifications are contrary to the rules and regulations of any municipality, the contractor shall then follow such rules and disregard the specifications.

It may be said hereto, that this shows incompetence and a disregard of the owner's interests by the architect so working. Also, it is needless to put such a humiliating admission into writing, for if any errors of this kind are found the inspectors will order the contractor to follow the rules. Consequently, it is often ordered that "all work to be done in accordance with the rules and regulations of the board of public works," etc.

Detailed drawings should accompany the general plans, except in case of large and complex structures, and in specifications for these, the work to be detailed later should be enumerated, thus at least indicating specific performance.

Personal attention can be demanded of a contractor if the contract was given him on personal grounds, for example is he claimed special fitness for the execution of the work; also in such instances he cannot assign his contract to another.

If, on the other hand, the contract was awarded to the lowest bidder, it is assignable, and such bidder need not personally supervise or execute the work.

It is well to remember that it is none of the architect's or owner's business who does the work nor the way it is executed, provided the work is completed to meet every requirement of the specifications and drawings, but if the operations undertaken indicate eventual loss to the owner, the architect's interference is justifiable.

Payments to contractor shall be made after satisfactory specific performance, or, in other words, when the contractor has reached specified stages in his work. A consideration of this, however, comes under the head of "Building Contracts."

Circumstances, conditions and surroundings will necessitate changes, and enlargement of the quoted form, but howsoever these may be, let the things to be done stand forth specifically. The same applies to the theory of the general specification the directive features of which will come under our observation.

* * *

He Called the Bluff.

Mother—Just run upstairs, Tommy, and fetch baby's nightgown.

Tommy—Don't want to.

Mother—Oh, well, if you're going to be unkind to your new little sister, she'll put on her wings and fly back again to heaven.

Tommy—Then let her put on her wings and fetch her nightgown.—Ex.

Portable churches are now being made as well as portable schools, the idea being to use them until it is developed whether there is a sufficient field to justify building a permanent structure in new communities.

Harmonious Furniture

IF FURNITURE could talk there would be a sorry outlook for some home makers. The carpet would shriek, "How dare you make me keep company with that wall? It ruins my looks!" while the wall in turn would find cause for complaint at the atrocious pictures hung on it.

The graceful Chippendale chair has just cause to feel outraged that it must act as companion for a gaudy rococo desk, and the rare Cloisonne vase is almost driven to falling on destruction to escape its perch of shame on a mottled marble mantel with hand-painted tiles.

Why are there so many houses which make us grit our teeth and seek quick escape? The conglomerate mixture of furniture is actual pain to the artistic eye, and we wonder how any one dare perpetrate such hideousness.

Ask the furnisher why she did it, and either she is supremely satisfied and marvels at your lack of taste or throws the blame on a slim purse. "It is easy enough," she says, "to have an artistic house if one has the money to pay for it."

To a certain extent this is true, but a full purse never has or never will take the place of good taste. If you have a home, or even a corner of one, to make habitable, neither groan because you have no money, nor, having it, buy everything that takes your fancy, with no thought of fitness. Good taste is nothing more than having a well-developed sense of suitability. A chair or table may be charming in itself and a fright in the only environment you can give it. Hangings, wall paper and rugs may each be beautiful, yet shriek when made to join forces. The woman who would have an artistic home does not say, "I like this, and this, and this," and, like them, possess them; she asks, "Will they like one another?"

The secret of good furnishing is to ask yourself, "Will my things feel comfortable together?" It is a simple question, but if faithfully answered will prevent many tragic errors in taste.

To buy a piece of furniture just because you like it is as foolish as to take a wife for her looks with no thought of disposition. Not only must you live with that purchase, but so must every bit of other furnishing in your room. If they fight, harmony is out of the question, and you and every one else will suffer in your artistic sense.

A woman once scrimped and saved for years to buy a French gilt pier glass, which when in place overpowered everything in a once attractive drawing room and made it look shabby.

In buying get things that are harmonious not only with one another, but with the architecture of the room they must fill and with the circumstances of the buyer. A Turkish rug on a rag carpet income will make its incongruity felt.—The Decorative Furnisher.

* * *

The Reflecting Power of Walls

ROOMS should always be decorated with a large consideration as to the reflecting power of the walls. Many times the oil man, the electric light company or the gas man is accused when the fault really lies in the wall papers or the draperies. The best oil, gas or electricity is powerless to light a room if the color on the walls contains great absorbing qualities. For instance, a white wall will reflect fifty per cent of light, whereas a red wall paper will reflect only fifteen per cent. This may or may not be a disadvantage, as it may be the desire to have a comparatively dark room. A light buff or yellow will reflect forty-five per cent; a dark brown about twelve and a half per cent. A light apple green wall paper will reflect forty per cent; a dark green will give fifteen per cent reflection. Dark wood trimmings eat up light, white wood reflects it.

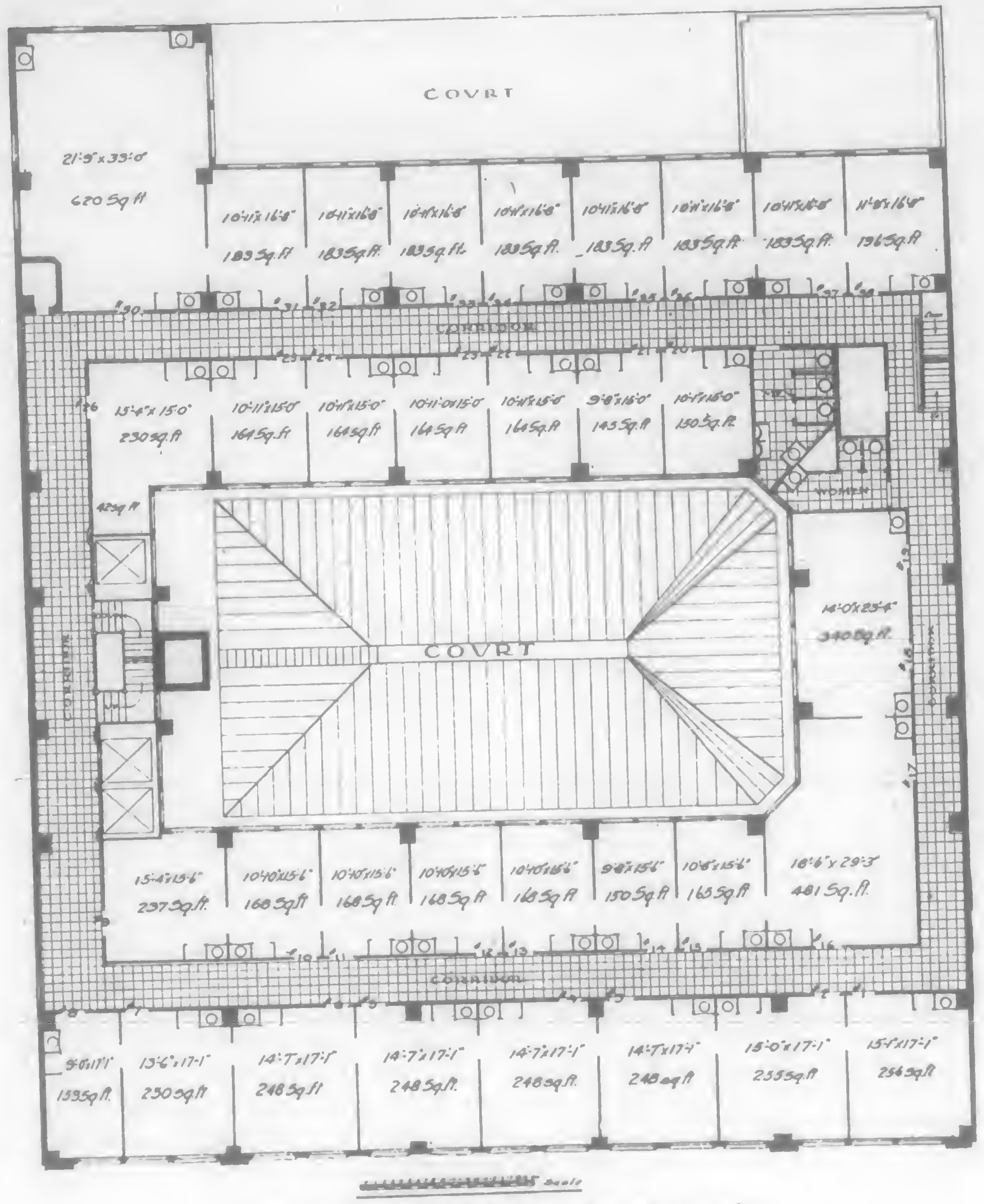


The Whitney Building, San Francisco.
E. G. Bowles, Builder; C. B. Rushmer, Engineer.
Equipped with Otis Elevators.

The New Whitney Building

OF THE many Class A buildings erected in San Francisco since the fire there is probably none better built or more conveniently arranged for its tenants than the Whitney building on Geary street, between Stockton street and Grant avenue. The structure is eight stories with steel frame, concrete curtain walls and brick and tile front. It is practically fireproof. The ground floor is taken up with stores, while the upper floors contain offices en suite and single.

The building was designed and constructed by J. R. Bowles of Portland, Ore., and the work was carried forward under the direct supervision of Mr. George A. Burch, Mr. Bowles' San Francisco representative, and his assistant, Mr. C. B. Rushmer.



Floor Plan of Whitney Building, San Francisco.

Something New

PLANS have recently been made for a country dwelling near New York, which will have disappearing partitions on the ground floor. The partitions will be operated by electricity, lowering them into the basements, thus giving an unobstructed floor space of the entire area. If this proves practical and architects and builders find the idea at all feasible, it may be quite an innovation to home builders.

The modern house with the ground floor practically unpartitioned, except with hangings, has its disadvantages. The dining room opening into the parlor is not always desirable at meal time. It is almost impossible to make a business engagement or have a private interview with an outsider at home. Even if the family consents to repair to the upper story an untimely caller puts an end to further discussion. The old-fashioned plan of chopping the ground floor into innumerable little halls and rooms was unsightly and unlivable. If a moderately priced home can be constructed which will be suited to the needs of entertaining, afford a comfortable dwelling place, and give the desired privacy at required times, it will be a boon to the community at large. It is therefore with a great deal of interest that this new experiment is being watched.

The Flat, as Seen by a Humorist

FLATS are now cultivated extensively throughout the country. Some varieties are short and scrubby; others grow to an immense height. Almost every flat has a spinal column running up and down its center. This is the elevator shaft, and consists of hot air.

When a flat is more costly than people can afford to live in, it is called an apartment. A flat in its primitive state consists of a small bathroom, almost completely surrounded by total darkness.

A flat is a substitute for home, at one time a popular winter and summer resort, where traditions were allowed to grow up carelessly. Now in every well-conducted flat the traditions are drawn out every morning through a tube by the pneumatic-cleaning process.

Babies happen occasionally, even in the best-regulated flats. Thus we see that Nature, even under modern surveillance, sometimes nods.

Flats are constantly growing in size and importance. It is estimated that very soon they will hold all the people in the world, who will then come to depend entirely upon our fertile roof gardens for their means of sustenance.

Flats have an awful mean temperature of two degrees below zero in winter and ninety-two degrees above zero in summer.

When all the trees have been made into flats it is thought the millenium will have arrived. Every flat has the word "Welcome" over the kitchen door. Also many of them this motto:

"All ye who enter here leave soap behind."—T. L. Mason, in Success Magazine.

* * *

Artistic Brick Buildings

A FRENCH architect of some standing lately visited this country and expressed his disfavor with much that we had done or are doing. Among other things the gentleman seems to object to brick buildings, stating with a contemptuous wave of the hand that "bricks are good enough for Brooklyn."

The American Architect takes this traveler to task for many things and adds in reference to brick: "He might have said for Brooklyn, Venice, Vienna, Blois and Versailles, without historical inexactitude. Far from being not good enough for New York, New York is not good enough to appreciate red brick. As long as we love red brick faced with white, we may take that as a symptom that we are a sturdy race. Brick may be inelegant to modern French eyes, but so is the natural sun-burned complexion. No amount of adverse criticism against brick building will convince us that we are too good for it until we have an altogether superficial and feeble view of life."

That journal might also have added that brick is one of the oldest materials with which man has built and is the best preserved of all the materials of antiquity. Moreover, it has ceased to be, not only in this country but in Europe as well, the substitute material it was some years ago, being used only there where granite, marble and the other expensive stones were too costly. It is a material now chosen for its artistic effect and in preference to these other more costly building mediae. Wonderfully beautiful effects and colors are secured in brickwork and architects are today vying with one another with designs, particularly for domestic buildings that will best bring out the subtle and artistic effects that can only be obtained in that material.

Among the Architects

American Institute of Architects

(ORGANIZED 1857).

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Glenn Brown (ex-officio).....Washington, D. C.
Walter Cook.........................New York
S. B. R. Trowbridge...................New York
J. L. Mauran....................St. Louis, Mo.

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For Three Years—Frank C. Baldwin, Union Trust Building, Detroit; S. B. R. Trowbridge, 527 Fifth avenue, New York; John M. Carrere, 225 Fifth avenue, New York.

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OFFICERS FOR 1909

President.......................Willis Polk San Francisco, Cal.
Vice-President.............E. F. Lawrence Portland, Or.
Secretary..........................D. J. Myer Seattle, Wash.
Treasurer.......... ....Myron Hunt Los Angeles, Cal.

San Francisco Architectural Club

OFFICERS FOR 1909

President..................August G. Headman
Vice-President..................Charles Sawyer
Secretary-Treasurer.............William Betts

Portland Architectural Club

OFFICERS FOR 1909

President.......................Jos. Jacobberger
Vice-President ....Edgar M. Lazarus
Secretary ....Ernst Kroner
Treasurer ....John G. Wilson

Washington State Chapter, A. I. A.

OFFICERS FOR 1909

President.............................C. H. Bebb
Secretary...................Arthur J. Russell
Treasurer..........................J. F. Everett

Palatial Winter Residence.

Architect Alfred F. Rosenheim, of Los Angeles, is preparing plans for a handsome mountain home to be erected on the 160-acre estate of G. W. Galbreath, a wealthy resident of St. Louis, who intends to occupy it during the winter months. The property is located near the Arrowhead Hot Springs, and is one of the most picturesque in that locality. The building will be of the Mission type, and constructed of reinforced concrete and will have a tile roof. It will have a wide porch on three sides, and an interior court or patio, 40x40 feet. The extreme dimensions of the building will be 90x100 feet, and it will contain sixteen rooms, twelve of which will be located on the main floor and four upstairs.

Architectural League of the Pacific Coast

WILLIS POLK, President.

San Francisco Club Joins Coast League.

There was an exceedingly large gathering of members of the San Francisco Architectural Club at their clubrooms Friday evening, May 28th, for the purpose of considering amalgamation with the Architectural League of the Pacific Coast. President August G. Headman presided.

Speeches were made by a number of those present, the tenor of which was the necessity of the architects of the city coming together and working along lines of mutual interest with fellow craftsmen of the Coast and National leagues.

Willis Polk outlined the vast amount of work that was to be done in San Francisco in the near future, both for the city and national government, and urged a get-together spirit.

Clarence R. Ward, an honorary member of the club, spoke of the past history of the Architectural Club and urged the older men to fall in line with the younger generation.

Speeches were also made by Louis C. Mullgardt, John B. Leonard, S. Schnaittacher, E. H. Hildebrand, William Crim and others.

Interesting letters were read from Henry A. Schulze, Fred H. Meyer, Albert Sutton, Reid Bros., L. B. Dutton and Professor Charles Derleth.

The proposition to amalgamate was passed unanimously and committees were appointed for the purpose of carrying out the details of the plan.

* * *

Los Angeles Architectural Club.

The regular meeting of the Los Angeles Architectural Club was held the latter part of May, at which time officers for the ensuing year were elected as follows:

A. F. Rosenheim, president; S. R. Burns, vice-president; E. Bean, secretary; and Otto Jensen, treasurer. The membership was strengthened by the addition of twenty architects and fifteen draughtsmen to the roll.

M. A. Vinson, business manager of the Pacific Coast League of Architects, was present and explained the objects and plans of this new organization. The league stands for the promotion of educational advantages for the younger draughtsmen, through the architectural clubs. It is the intention of the league to hold a large architectural exhibition in Los Angeles during next November. The club voted unanimously to join the league, thus becoming a unit of the organization. A committee was appointed to secure suitable quarters in which to hold the exhibition, and for future meetings.

The following is a list of the present membership of the club, a majority being new members: G. N. Alcon, F. C. Ayars, H. E. Bean, J. F. Blee, F. H. Brooks, S. R. Burns, R. J. Clark, W. D. Cork, Jr., R. M. Cassidy, H. C. Chambers, F. P. Davis, F. H. Eley, R. D. Farquhar, J. A. Griffon, Elmer Grey, Edgar Harvey, J. C. Hillman, Myron Hunt, E. R. Jeffrey, Otto Janssen, A. R. Kelly, J. P. Krempel, F. T. Kogley, Jr., E. C. Kent, Duane Lyon, L. S. Moore, Octavius Morgan, A. C. Martin, W. A. O. Munsell, E. S. Mayberry, Alfonso Mitterhausen, Irving Osgood, Fernand Parmentier, John Parkinson, Scott Quintin, A. F. Rosenheim, C. C. Rittenhouse, Jr., M. D. L. Scott, W. A. Sharp, F. S. Stiff, W. F. Thompson, R. F. Train, P. J. Van Trees, M. A. Vinson, W. H. Werner, J. M. Watlington, H. F. Withey, A. R. Walker, W. H. Wilson, R. E. Williams, Otto Weber, F. O. Wells, Montrose Warn, Los Angeles; R. Wilson, Pasadena; Jacques Sindorf, Hollywood; W. P. Middleton, Alhambra.

* * *

Chapter Joins League.

The Southern California Chapter of the American Institute of Architects at the regular monthly meeting held at Los Angeles in May, unanimously voted to become a part of and support the Architectural League of the Pacific Coast, and is the first A. I. A. Chapter to take this step. The purposes and organization of the league were explained by M. A. Vinson, business manager of the Portland Exhibition, and by the president of the Chapter, Myron Hunt, who is treasurer of the league.

Aside from this action, routine matters pertaining to the work of the Chapter consumed the remainder of the evening following the usual dinner. L. W. Barnett and H. F. Withey were declared elected to junior membership in the Chapter upon the opening of the letter ballot. The members present were: J. C. Austin, J. Lee Burton, P. W. Ehlers, J. C. Hillman, Myron Hunt, Frank Hudson, E. C. Kent, J. W. Krempel, Octavius Morgan, Fernand Parmentier, A. F. Rosenheim, A. Wackerbarth, G. F. Costerisan, A. R. Walker, W. C. Pennell, S. B. Marston. As guests there were M. A. Vinson, J. J. Backus and A. A. Hubbard.

* * *

Seattle Architectural Club.

H. A. Moldenhour, secretary of the Architectural Club of Seattle, Wash., sends the following account of the club's first year of activity:

Following the example of several prominent cities of the East, a few local architects and draftsmen a year ago organized the Seattle Architectural Club. During its experimental period the public was not made especially aware of its existence, but its growth has been made so persistent, and its purpose is so commendable that its continuance seems now to be of natural interest to the city.

Organized with thirty-five charter members, within the year it has grown to a membership of over sixty, composed of such architects and draftsmen (and material men as associate members) as take a lively interest in the educational, social, and essentially aesthetic phases of architecture.

In the purposes of such an organization the public should feel a considerable interest, since it is from the ranks of such bodies that cities must recruit the architects of its future buildings, and obtain trained assistants for the solution of its aesthetic problems. The life of such an organization is dependent upon a vital enthusiasm for civic and professional betterment, entirely removed from ulterior motives, and underlying its activities is a strong desire to serve the commonwealth, both in suggestions for some concrete improvement of the city, as well as in the better equipment of those to whom such tasks are likely to fall in the years to come.

The past winter the club has had the benefit of lectures by local architects, as well as by men from other cities; the topic of civic improvement has been interestingly discussed; the younger members, under the direction and criticism of the older ones of the club, have devoted much time to the study of various architectural problems, and drawings have been sent to the East, in connection with similar work from other centers to be judged by prominent architects, with gratifying results.

So far the club has been able to provide itself with only small and uninviting quarters, but with a strengthening membership and interest it is planned to obtain at an early date rooms where a proper housing can be given its loan exhibition, better drafting facilities secured, and a comfortable and cheerful place for its purely social life provided. A committee is now considering the subject of suitable clubrooms and may act upon the suggestion that some old residence near the business district might, with characteristic furnishings and decoration, serve the needs of the club.

The first annual meeting was held March 27, 1909, at which for the ensuing year D. J. Myers was elected president; J. C. Stanley, vice-president: H. O. Moldenhour, secretary; E. E. Ziegler, treasurer, and E. Sonnichson and W. K. Macomber members of the executive committee. The subject of an annual architectural exhibition was broached and at a recent special meeting attended by about thirty of the leading architects of the city, the matter was discussed at length, with the result that the club voted to undertake an exhibition to be held early next year. By affiliation with similar organizations in Los Angeles, San Francisco and Portland an opportunity will be given the public to see a quantity of work from these other cities, and for Seattle architects and draftsmen to measure their work by other than local standards.

Special Meeting of San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter, American Institute of Architects, was held in the green room of the Hotel St. Francis on Thursday evening, May 20th.

A committee was appointed to draft suitable resolutions upon the loss the Chapter and the architectural profession had suffered by the death of the late Mr. Newton J. Tharp, City Architect.

A committee was appointed to draw up rules of competition and submit the same to the Chapter. Also further consideration was given to the programme for the proposed City Hall competition, and it was decided that consideration of it be made the special order of business for the next meeting.

Messrs. Aleck E. Curlett, William H. Crim Jr., William L. Woollett and Ralph Warner Hart were elected Chapter members.

Messrs. David Farquharson, Charles Kenitzer, Henry Kenitzer and John Wright were elected honorary members of the Chapter.

The adjournment of the Chapter was taken out of respect to the memory of the late Newton J. Tharp.

SYLVAIN SCHNAITTACHER,
Secretary.

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FIREPROOF SCHOOL HOUSES

Los Angeles will spend nearly three-quarters of a million dollars for new school houses. Unfortunately, there was no stipulation in the provisions of the bond issue that the buildings should be of fireproof construction. The Southwest Contractor suggests that a popular injunction suit against the sale of the bonds recently voted by the city might prevent the use of a vast sum of money for anything but fireproof buildings. Such a proceeding would undoubtedly receive the full support and approbation of the public.

The memory of the Collinwood (Ohio) disaster, which sent a thrill of horror into every home in the country, is still fresh, and it ought to serve as a constant reminder of the need of a greater degree of safety in schoolhouse construction. Los Angeles and the Southwest in general has too many firetraps in the old buildings now used for school purposes. And, no matter how many features may be added in adequate fire escapes and proper exits, the danger of disaster can never be entirely eliminated, as it should be, if the school houses are constructed of inflammable material.

Practically all of San Francisco's new school houses are of class A construction, which means steel frames, concrete and brick walls and metal window and door trim—all recognized fire-resisting materials.

SAN FRANCISCO'S NEW CITY ARCHITECT

The San Francisco Board of Public Works has made a wise selection in appointing Loring P. Rixford as City Architect, to succeed the late Newton J. Tharp. As chairman of the Supervisors' Building Committee, Rixford was in touch with all the plans of the City Architect, which probably makes him better able to carry on the work begun by Mr. Tharp than any one else the Board could have named. Rixford spent much of his time in the City Architect's office and frequently offered suggestions to Mr. Tharp's draughtsmen which were carried out. Prior to his appointment on the Board of Supervisors not much was heard of Mr. Rixford in a public way, and his architectural work was confined principally to residences. He was educated at the Ecole des Beaux Arts, Paris, where he was a student with Mr. Tharp.

Recently Mr. Rixford's plan of the Bohemian Club building was selected in competition with a dozen or more prominent architects. The exterior design of this building is said to have been worked out by a young artist named Demari who was at the time in the office of the City Architect. Young Demari has since gone back to State Engineer Ellery, from whom he was engaged by Tharp at a large salary.

The municipal buildings to be erected under the bond issue of 1908 were planned by Tharp and will be completed by Rixford. The Hall of Justice, San Francisco Hospital, the infirmary on the Relief Home tract, the Commercial High School, the Mission Grammar School and the other institutions will stand as monuments to the dead architect's memory. In addition to the gigantic work of planning these new buildings, Tharp supervised the construction of the schools erected under the 1904 bond issue. Wherever he found it necessary to amend the original plans so as to add to the safety of these buildings and improve their sanitary arrangements he was not slow to act, for it was his aim and purpose to give to San Francisco the safest and most modern public structures known to architecture. Knowing Mr. Tharp so well and possessing such full knowledge of his plans, Mr. Rixford cannot be else but most valuable to the city of San Francisco.

SAFER BUILDINGS REQUIRED

Until comparatively recently, nearly all kinds of buildings were tolerated in our cities, so that today we have a hodgepodge medley of highly combustible and dangerous buildings, interspersed among which are a few, very few, fire-resisting and first-class structures—not over 8,000 in our total of over 12,000,000 buildings in the country.

Of late years building ordinances have been enacted in most of our cities, but they have been rather lax and still more laxly enforced. Wood has been too freely permitted, inferior construction has been allowed in too high buildings, so-called "slow-burning" construction has been permitted, and far too great latitude has been given the exploiters of the various reinforced concrete systems to experiment with their untried and often most questionable expedients, in the name of economy. Endless troubles and sometimes disasters have resulted. For instance, the too liberal permission to use wood was the very direct cause of the appalling losses by fire in Baltimore and San Francisco and likewise in the devastating though lesser fires of more recent date.

The authorities are awakening to the necessity there is for more stringent legislation. New York has taken the lead in revamping its building ordinances, and the other cities will undoubtedly soon follow suit. New York's Building Code Commission has completed its labors and evolved a splendid schedule of requirements. It limits the height of combustible buildings to three stories in congested districts; it limits likewise all constructions of other than absolutely fireproof materials to safe heights so that they can be easily handled by the fire departments in case of fire, and it recognizes as standard fireproof construction buildings erected of steel frame protected with hollow fireproofing tile, a system that has been in vogue for thirty years and has stood satisfactorily every fire to which its properly assembled parts have ever been exposed. With few exceptions, the leading architects and engineers of the country thoroughly approve of the new code proposed for New York and contend that in building laws, as in the divorce laws, for instance, there should be uniformity in all the states. It would be a very great advantage to the entire country if the State authorities, rather than the city, would adopt New York's building code and make it uniform and obligatory in all the cities of each state.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

The Basic Principles of Heating and Ventilating.

By S. W. MARTIN, Engineer, Los Angeles.

MUCH has been written and many theories advanced on the all important subject of heating and ventilation, yet this question seems little understood. Many ways are now employed to utilize the heat units contained in the different fuels to make our homes comfortable at a minimum cost, and the results are varied. However, the fundamental principles are simple and they can readily be understood if we proceed along logical lines in our reasoning.

In this article we will confine our thoughts mostly to indirect or furnace heating. A few practical suggestions along the line may be interesting. We will start with an explanation of the principle of circulation, which must be thoroughly understood before we can solve any heating and ventilating problem. Warm air and cold air will not mix, but a body or strata of one will replace or drive out the other. Hot air will rise while cold air will seek the lowest level.

First, let us take one room, which will illustrate the house to be heated. Remember that when the fire is lighted in the furnace, the room to be heated is filled with cold air. To heat this room, we must replace the cold air with warm air. To illustrate how this may be done to best advantage, let us compare the room filled with cold air to a vessel filled with cold water, for water can be seen and the heating of water is more generally understood. There are a number of ways of heating the water in the vessel, as many as in heating the air in the room. We can place the vessel on the stove and as the water is heated at the bottom, it rises to the top; at the same time the cold water replaces at the bottom the heated water as the latter ascends, until finally all the water becomes heated. Owing to the principle of circulation, then, the body of water in the vessel becomes heated from the top down. To prove this, note how in the heating of water in a tank, into which the hot water flows through a pipe in the bottom, the outside of the tank becomes warm at the top first, the heat being gradually felt lower down until the water in the tank becomes hot by the replacing of the cold by warm.

To heat our room, we must employ exactly the same principle. If we employ direct radiation, say a stove, the air resting on the stove's surface becomes warm and ascends, allowing the cold air to replace it, become heated in turn until the whole body of air in the room is heated. Bear in mind that the air in the room and the water in the vessel are both heated from the top down by working of the principle of circulation. Now if we should attach a pipe to the bottom of the vessel and allow the cold water to run off, at the same time allowing heated water to enter from above the body of cold water would be replaced by the hot not by circulation but by mere gravity. But if we did not remove the cold water and provided no means of circulation, what hot water did enter the vessel would ascend or remain at the top and the cold water at the bottom would remain cold.

The same conditions would prevail in admitting warm air to the room. It would bank at the ceiling, and unless the cold air was removed, the temperature at the ceiling would probably be 150 degrees while the lower part of the room would remain cold. To successfully heat the room we must not only provide a means to remove the cold air, but the more quickly it is removed the more quickly do we obtain a warm room. The principle is the same as in heating the vessel of water. Hence the importance of putting cold air registers in the floor to allow the cold air to flow into the cellar as the heated air enters.

Another illustration: In this climate particularly, the temperature is usually lower in the house than outside, even in the shade. Hence we frequently open the doors to allow the warm air to enter. In this case the warm air flows in at the top of the open door while the cold air goes out at the bottom. To demonstrate this hold a lighted match at the top of the opening and the flame will be carried inward; hold it at the bottom and the flame will be carried outward.

Now some of our most valuable discoveries have been taken from Nature and a study of its action. We can only adapt Nature's principles, we can not invent the principles themselves. In this connection we will not except the progress of electricity or the accomplishments of the Wright brothers with their flying machine. So it is with heating and ventilation, we must adapt what we learn from Nature to succeed.

As to heating a house comfortably and economimally, we will take another homely illustration, what is generally known as the fireless cooker. In the use of the fireless cooker we are instructed to bring the article to be cooked up to the boiling point, which is 212 degrees, and know that it is heated to that temperature all the way through. We are then directed to place it in a receptacle that is so arranged that the heat cannot escape or the cold enter. Hence it retains the heat long enough to thoroughly cook the food. If we should allow the temperature to rise to only 150 degrees before placing it in the fireless cooker, the food would remain there for weeks without obtaining the desired results. So in heating a room, first have sufficient heat, in temperature and volume, to displace the cold air as quickly as possible, say in fifteen or twenty minutes, securing a floor temperature of say seventy degrees, then we will require but little heat to maintain that temperature and keep the room comfortable.

If we do not displace the cold air, if our heating apparatus does not furnish a sufficient volume of heated air to fill the room and drive out the cold air, we will never have a comfortable and uniformly heated room.

The question is often asked, which is the most economical fuel to use for heating? Our answer might be the one given by the lad to the man who asked him which was the better of the two hotels in the village; the answer was, "Mister, if you stop at one you'll wish you'd stopped at the other." People having the advantage of natural gas in the East find it at 25 cents per thousand cubic feet not only cheaper than coal but a luxury. Let us figure a little. The writer of this article had the privilege of using natural gas for more than twenty years at 25 cents a thousand feet; good Hocking coal could be bought for $3.00 per ton; one ton of coal at three dollars equal in price to twelve thousand cubic feet of gas at 25 cents per thousand. In California coal is about $12 per ton, which is equal to fifteen thousand cubic feet of gas at 80 cents per thousand. It will be found that at these prices a greater per cent of saving can be realized with gas at 80 cents than in the East with gas at only 25 cents per thousand, for coal is much higher here, relatively speaking.

Bear in mind this article is not written in the interest of any gas company, nor do I advocate the use of gas in a furnace constructed to burn coal or wood. Gas should be used in a furnace constructed for that purpose, and should be made of thin sheet metal with sufficient radiating surface to utilize at least ninety per cent of the heat units of the gas. There are scores of furnaces in use in this State that will do this, and that are giving entire satisfaction.

Concrete Dry Dock.

C. M. Leach of Boston was the lowest bidder for the construction of a reinforced concrete dry dock for the Pearl Harbor naval station. His bid was $1,295,321. The San Francisco Bridge Company, Monadnock building, San Francisco, was the next lowest bidder, its figure being $1,760,000.

DEVELOPMENTS IN ORNAMENTAL AND BOULEVARD LIGHTING

By Charles L. Eshleman, in the Illuminating Engineer.

PUBLIC improvement societies, municipal art leagues and civic associations throughout the country have in the last few years been particularly active in devising schemes whereby the appearance of their respective cities might be improved. In most cases it is impossible to move or make any radical improvement in buildings already erected, consequently the attention of these societies has been focused on street and park improvements. The initial step has usually been the design of a new lighting system, but in many cases the product furnished by the manufacturer, although mechanically perfect, has not entirely met the approval of the ever critical members of the civic federations, for the reason that the source of illumination was insignificant as compared with the size and height of the posts, and the effect produced inharmonious and inartistic.

The wave of civic reform now passing over our country has had its effect upon central station lighting companies, both large and small. Electric light companies, especially those in cities of 50,000 population and over, are spending much time and money in underground cable work, and few cities of any prominence are now without electric light systems operated through underground circuits. The feasibility of this method, from an electrical and commercial standpoint, has been fully demonstrated by the prominent companies of New York, Boston, Philadelphia, Washington, Pittsburg, Cleveland, Chicago, Baltimore, Minneapolis, Kansas City, San Francisco and hundreds of other cities during the last ten to fifteen years. That the interests and safety of the public would be subserved by placing all electric light wires underground in the more congested parts of large cities where wires are numerous, no one will doubt, and the electric light companies themselves now realize that even from a financial standpoint it is an advantage to them in such localities because of the great saving in repairs and renewals, freedom from interruption of service, prevention of damage suits for injury to persons and property, and the improved appearance of city streets.

The above conditions have been responsible for the development of a boulevard lighting system. The idea was first conceived by Mr. W. E. Daniels, operating engineer of the South Park Commission, Chicago, Ill., whose position gave him an excellent opportunity to study all phases of outdoor lighting. Each unit of the boulevard lighting sys-

tem consists of a reinforced concrete base, shaft and capital of classic design, the whole surmounted by a complete arc lamp mechanism inclosed within a 20-inch opal glass globe.

The post is ordinarily made of reinforced concrete, and by proper mixture of ingredients can be made to correspond to sandstone, marble or granite. Pressed steel posts of all designs can be furnished with the system for practically the same price as concrete. It is stated that the outfit sells for one-half the price of cast iron, that the concrete is indestructible, requires no painting, and is more ornamental than cast iron gooseneck and crook posts now so commonly used for suspending arc lamps. The lamp mechanism is somewhat shorter than the regular type of arc lamp, but allows the use of nine-inch upper and four-inch lower electrodes, thus insuring a life of 125 hours on multiple direct current and alternating current types, and 100 hours on series direct current and series alternating current types. The use of the large globe insures perfect diffusion, entirely does away with uneven distribution of light due to the travel of the arc, and produces a quality of light heretofore unequaled.

A Word to Plumbers.

The journeyman plumber sometimes prides himself in dodging the regulations because in doing so he fools the inspector. In doing this he makes several mistakes. The regulations in regard to the weight of pipe, methods of making joints, repairing leaky and cracked pipes, and many other things relating to practical details of work, were all made by practical men, by experienced plumbers who were first-class. The rules were formed so as to insure first-class work, and as they were making the rules for themselves they did not make them in such a way as to increase the cost of workmanship.

In olden times when plumbing rules were new, the journeyman said to himself that there was no reason for putting three-quarters of a pound of lead per inch diameter into the hub of an extra heavy pipe, so with some old newspapers in the bottom and oakum on top of that he filled up the hub until a thin ring of lead filled the hub approximately flush. This took rather more time than putting in the ordinary quantity of oakum. The thin ring of lead required very careful calking and sometimes had to be taken out and poured a second time. But in the end he effected a saving of one, two or three pounds of lead, according to the size of the joint. This gave him great satisfaction.

On one occasion where work of this kind had been done it was brought to the

attention of the boss plumber, who happened to be of the type known as a "skin." He had no love for inspectors or rules, but he remarked in regard to the work: "Didn't the fool know that while he was saving 12 cents' worth of lead he wasted 25 cents' worth of time?" There are a great many such economies in plumbing. Savings can be made in the expenditure of material, but they cost more than they are worth. With a thin ring of lead, unless unusual care has been taken with the oakum, the lead will sink in places, being driven down before it expands so as to fill the joints. Where a line is subject to a water test, a few such joints will cost perhaps twice as much in time as if they had been made in the regulation way.

Cracked lengths, cracked hubs, blowholes that cannot be plugged and other similar defects are often put in place with the hope of getting them passed by the inspector. If they are found, the usual song is, "We didn't see them," or "We hadn't noticed them." Such an answer would pass muster if the blowholes were not always carefully turned so as to bring them out of sight. It is far better for the master plumber frankly to condemn such a pipe and refuse to put it into the job than it is to run the risk of having to take the defective pieces out. —Carpenter and Builder.

Giving the People What They Want

The late P. T. Barnum enunciated the great truth that "the people liked to be humbugged"; and every manufacturer of inferior goods, every merchant who resorts to subterfuges and misrepresentations, every salesman who bases his efforts on "talking points," and every professional charlatan, when finally run to cover, will take refuge in this assumed truism: they are "giving the people what they want."

Now, the curious thing about it all is that Barnum's dictum is not true; and the fact that he knew this himself is amply shown by the features of genuine merit which always made up by far the larger part of his "greatest show on earth;" the humbugs were merely for the sake of arousing curiosity and attracting attention. No one likes to be deceived; every one is glad to learn, and to improve his condition, when the knowledge is properly presented.

It may be easier to make a single sale by trading upon a customer's ignorance and flattering his vanity, but when such a customer once learns the truth he is lost to that salesman; while the man who has been persuaded, even at the cost of considerable effort, to accept an improved article, or to employ better methods, is not only a permanent customer thereafter, but an advertising agent as well. The man who has made a good bargain, or has secured something better than his neighbor, is bound to let his superior acumen become known. To educate people to accept only the best may be a slow and disheartening process, but it is a permanent investment, and once having been judiciously made, will continue to bear interest for a long time afterward. It is the unsolicited business that pays, and this kind of business comes only from that intangible thing known as reputation; and reputation comes, not from catering to ignorance and prejudice, but to producing the best and demonstrating its superiority.

These general observations apply to the manufacture and sale of lighting fixtures and to constructive illuminating engineering with full force. When a plea is made for more artistic designs and better results in illumination, the old answer is often made: "They are not commercial; we have to give the people what they want." And this will doubtless continue until the millenium arrives. It will always be possible to divide humanity pretty definitely into those who lead, and those who are led—whether considered socially, politically or commercially; and the majority will be found on the side of those who are led.

The fixture manufacturers who keep abreast of progress in the production of light, and even push ahead of the procession in adapting their manufactures to new conditions as they arise, are bound to be in the lead. The truth of this has already been demonstrated. Progress in these days, moreover, has struck such a rapid gait that those who hesitate are more than ever in danger of being lost. —Ex.

Will Test Apartment House Act.

Architects who specialize in building apartment houses have discovered that the new state law governing tenement houses applies to apartment houses and practically prohibits erection of an apartment house on lots that have two frontages on parallel streets. The section dealing with such buildings was not noticed until after the act became a law and was signed by the Governor. Now it is said by some architects that important work is held up by the state law, which supersedes the ordinance regulating construction of apartment houses, and a test case may be made soon in the courts on the constitutionality of the new law.

Prize Fight Promoter to Build.

It is reported that James Cofforth, the fight promoter, will erect a $30,000 mansion in Hayward Park, San Mateo.

By the Way

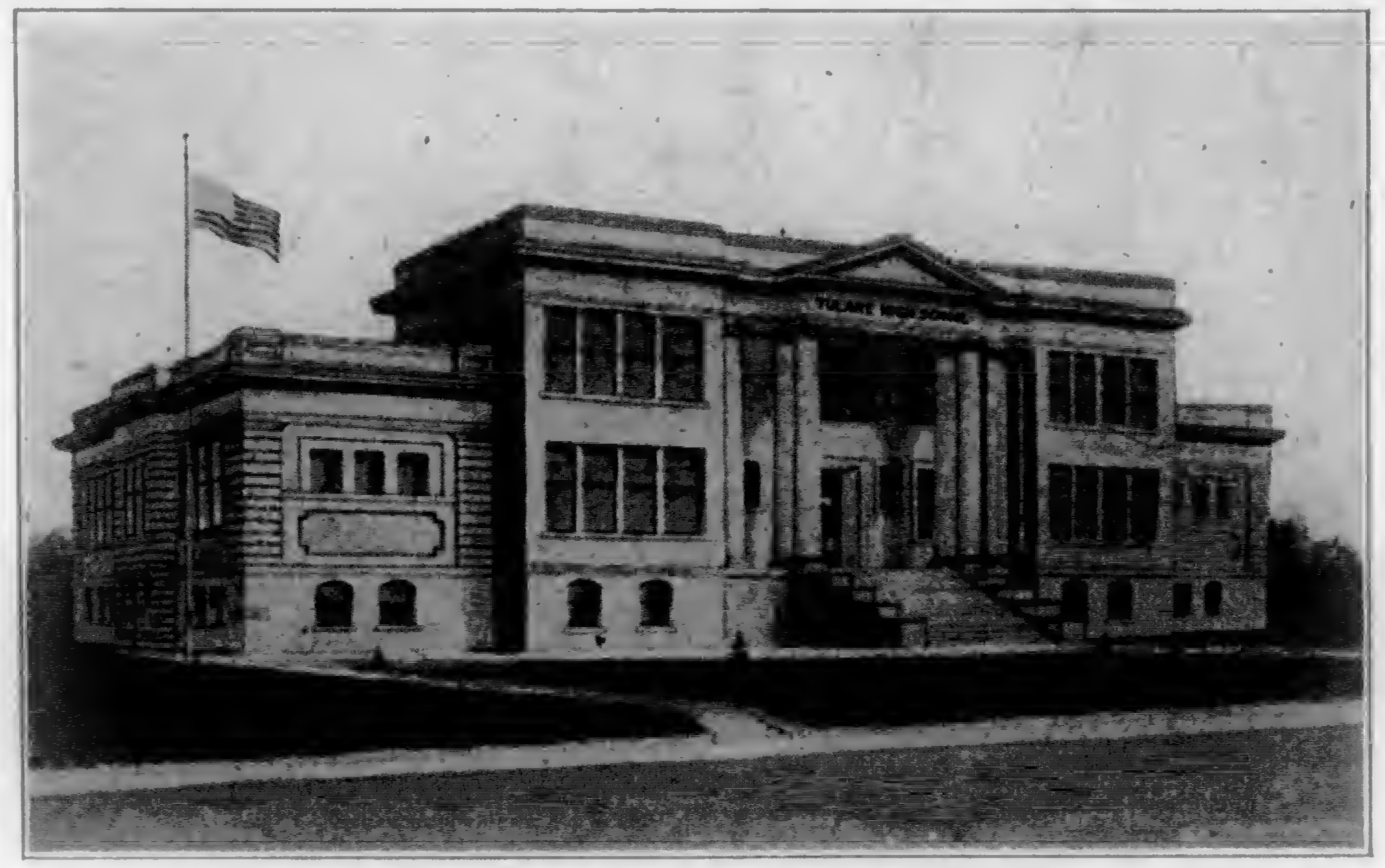
Some Industrial Information Worth the While

Terazzo Trays a Failure.

The cement laundry tray industry in San Francisco threatens to receive temporary set-back by some of the terazzo manufacturers whose regular business has fallen off to such an extent that they have been forced to take up new lines to save themselves from complete anihilation. They have undertaken to make terazzo trays. Those who have experimented with them predict a short life for the industry. They have found them a poor substitute for the cement tray. The trays are made of a combination of cement and chopped marble, but the marble prevents proper penetration of the cement which, of course, means that the tub cannot be properly tamped. It is the thoroughness of the tamping that insures an absolutely reliable tray. It is charged also that cheap cement is used by the terazzo people which is another serious drawback in the manufacture of a first-class laundry tray.

Will Build Residences.

Two contracts have been signed for the erection of residences at Taylor street and Broadway, San Francisco. The architect is Albert Farr, and the owners are Homer Parker and Henry Roedings. The houses will cost about $7,000 each and will occupy a 50-vara lot.



TULARE HIGH SCHOOL—E. Mathewson, Architect

Paraffine Paint Company Moves.

The Paraffine Paint Company, famous the Coast over for its superior Malthoid roofing and its Pabco Damp proofing compound, has moved from the Merchants Exchange where it has been located since the fire, to its own building at 38-40 First Street, San Francisco, Edgar M. Swasey, head of the Company's splendid advertising department, is in the same building as are all the offices of the executive officers and sales department.

Personal.

Architect William A. Newman has moved his offices from the Lick building to 418 Mechanics Bank building, San Francisco. Mr. Newman has no partner.

Architect Charles Peter Weeks of Sutton and Weeks, Mutual Bank building, San Francisco, expects to be abroad six months or more. Mr. Weeks started on his trip early in May.

Who Makes What.

That is the suggestive title of a book of reference for buyers and makers which has just been published by Daniel T. Mallett of 253 Broadway, New York City. The book is a valuable acquisition for those in need of a reliable directory of manufacturers, products, jobbers, wholesalers, foreign merchants and export commission houses and buyers. It contains a geographically—alphabetically arranged list of the names and addresses of more than 12,000 manufacturers in all parts of the United States. The book may be had upon receipt of the price, one dollar, postpaid.

San Francisco Ranks Fourth.

The relative rank of the cities in cost of building operations is interesting. New York is first, the cost of its buildings exceeding the cost of those of its closest competitor, Chicago, by $50,584,582, or more than 75 per cent. If the cost of operations in Brooklyn, the third city in rank, is added to that for New York, the total will be $163,684,622, or 30 per cent of the cost of the building operations of the forty-nine cities included in the table. San Francisco is fourth in rank, Philadelphia is fifth, and St. Louis is sixth. Seventh in rank is the small, rapidly-growing city of Seattle, which spent more for buildings in 1909 than Pittsburg, which was eighth; Boston, which was ninth, and other cities much larger. This great activity in Seattle is ascribed to the extremely low prices of building materials and labor.

Of the permits issued or buildings erected 38.64 per cent were for buildings of fire-resisting materials, and 61.36 per cent for wooden buildings, corresponding closely to the percentages in 1907. The average cost of brick or fire-resisting buildings in 1908 was $9,089 and of wooden buildings $2,101.

Chicago reported the largest number of brick buildings—8,208, with an average value of $6,818; Philadelphia the next largest number—6,778, with an average value of $3,308. Brooklyn reported the third largest number of brick buildings and New York the seventh, though in cost of buildings of this class it is first. New York reported 1,884 brick buildings costing $103,064,486, or nearly twice as much as Chicago's 8,208. The average cost of fire-resisting buildings in New York was $54,705. No wooden buildings were erected in the borough of Manhattan, those reported for New York being in the Bronx. The largest number of permits for wooden buildings was issued in Seattle—7,777, the average cost of the buildings being about $1,000. The next largest number of wooden buildings was reported by Los Angeles—4,679, costing on an average $1,383. The greatest cost for wooden buildings was reported by San Francisco, the average cost being $3,641. Chicago, which reported the largest number of brick buildings, was eighth in number of wooden buildings. Except for Reading, where none were erected, Philadelphia reported the smallest number of wooden buildings—45, with an average cost of $1,482.



Sing Fat Building, Chinatown, San Francisco
T. Paterson Ross, Architect — *A. W. Burgren, Engineer*
Equipped with Otis Elevators. — *Equipped with Dean Reversible Windows.*

The Dean Reversible Window—What It Is.

"NOW, if somebody would make a window sash that could be applied to the regular cord and weight window so that the latter could be reversed as well as raised and lowered, the architect would be relieved of a trying problem," remarked a member of the profession to one of his clients recently.

"There are plenty of so-called pivoted windows on the market, continued the architect, "but the trouble with them is they won't push up and down as well as in and out."

Yes, he had heard of the Dean reversible window, but he understood it lacked the same important features that so many other patent windows lacked—an attachment for raising and lowering the sash and "pivoting" it at the same time.

This man was like too many others of his profession, sorry to say. He was misinformed. As a matter of fact the Dean window meets every requirement wished for by the architect quoted above. It is truly a distinct innovation in window sash. It insures perfect ventilation and makes window cleaning safe and easy by eliminating the dangerous practice of climbing outside of windows. It is especially effective in big office buildings where a large, single plate of glass

is used, doing away with weights and cords.

For fine residences, flats and hotels there is nothing so convenient as the Dean reversible sash. A half screen can be furnished with this style of window if desired.

The Dean reversible window has been manufactured in San Francisco for a period of nine years during which time it has been used, and is being used on many of the prominent office buildings, hotels, apartment houses, flats and residences in the city. The company operates one of the most complete planing mills on the Coast, its machinery being of sufficient capacity to turn out any number of windows on short notice.

At the present time the company has under construction windows for D. N. and E. Walter at Stockton and O'Farrell streets; Spreckels building, on Market street, between Mason and Powell; the building adjoining the Orpheum Theater; Harry J. Moore building, O'Farrell street, near Grant avenue, A. Kreling, architect; Newman & Levison building, Stockton street; Charles F. Doe building, Kearny street; Whitney Estate building, Geary street, E. G. Bowles, architect, and a number of others. Installations since the fire have included the Pacific and Westbank buildings, Charles F. Whittlesey, architect; Argonaut Hotel, Righetti and Kuhl, architects; Sing Fat building, T. Paterson Ross, architect; Hanford building, Market and Davis streets, C. M. Rousseau, architect; Fisher building on Market street between First and Second; Hastings building, on Grant avenue, opposite Shreve's; Roos Bros.' building, Market street; Fisher residence, on Presidio Terrace, and numerous other commercial buildings and private residences.

Vigorite for Waterproofing.

The Holmes Lime Company's Vigorite brand of hydrated lime is now being extensively used as an admixture with Portland cement, and the regular proportions of sand and crushed rock for making concrete waterproof. The company is working on an extensive campaign of education along this line by mailing data from prominent Eastern and European authorities, as well as Pacific Coast tests, to architects, consulting engineers and concrete contractors, proving the advantages of an admixture of hydrated lime to Portland cement for making concrete work waterproof. This work has been favorably taken up by architects and engineers, and is opening up a large field for hydrated lime.

Mission Style Waning.

Is the popularity of the Mission style of architecture on the wane? Santa Barbara architects think it is—at least, those who cater to the wealthier class of Eastern tourists who annually visit that city and who in course of time grow to love California sunshine and climate sufficiently to build winter homes. The tendency today among this class, say the architects, is to revert to the Colonial style, the impression seeming to have spread that the Mission type is neither a permanent nor a true California style. It would seem that the test of the Mission type as a "fad" or not a "fad," could be accurately gauged in Santa Barbara, where is located one of the oldest and most picturesque Spanish Missions, and where the prevailing tendency has been towards this design in all the better classes of residences at least. Perhaps it is the abortions that have been called "Mission," perpetrated in the name of architecture and exhibited in too many cheap constructions, that have turned a great many prospective builders against this style, which in the East is so closely identified in the public mind with the thought of Sunny California.—Southwest Contractor.

W. W. Montague on Market Street Again.

The many friends and patrons of W. W. Montague & Company, the well known San Francisco firm, will be pleased to learn that it is again doing business in the down town section, having just moved into the new three story, terra cotta front building, at 557 to 563 Market street which is practically the same location occupied by the company before the fire. There is probably no one house on the Pacific Coast that does a more extensive business in mantels, grates and tile, for no job is to small and none is too large for them to handle. Fire place fixtures of almost any design can be turned out at short notice and full satisfaction guaranteed.

The always popular mosaic and ceramic tile floors are also handled by the Montague Company and a number of large contracts have been filled since the fire, among the more prominent buildings tiled being the Phelan building and the new Emporium.

Reinforced Concrete Pipe.

The large number of contracts for reinforced concrete pipe for water lines, irrigation systems and sewers attests the growing popularity of this comparatively new transmission pipe. The Reinforced Concrete Pipe Company, Central building, Los Angeles, now has under construction numerous such systems throughout the Pacific Coast states and Mexico. The company is in a position to execute any contract and is prepared to furnish estimates for any undertaking of large or small size.

Establish Coast Branch.

The high character of the products made by Parker, Preston & Co., Inc., has been so much appreciated by the good people of the Pacific Coast that the manufacturers have been forced to establish a branch office in the Central building and warehouse in Los Angeles, to supply the increased demand for their waterproof and odorless Art in Shingle Stains, Adamant cement, brick and plaster coating, Adamant cement floor coating, and other specialties made by them.

The Pacific Coast management is in charge of Messrs. C. C. and E. H. Olney, reliable, energetic, wide-awake and pushing men, direct from a practical and successful business experience in New York, and who will be found ever ready to serve the buyers and consumers of their company's products.

With the increased facilities and every attention given to the handling of the Pacific Coast trade by the Parker, Preston & Co.'s Los Angeles branch, no doubt there will be a large increase in demand for the company's products.

Tozer Moves Down Town.

The down town section of San Francisco is rapidly filling with the old established houses that used to form a conspicuous part of the business life before the big fire three years ago. One of the latest to move is the Tozer Company, which is fortunate in securing a location even more desirable than that enjoyed prior to the disaster of 1906. The new home of the Tozer Company is at 228 Grant avenue, next to the White House and up one flight of stairs. Here can be found almost everything in the interior decorative line, including a great varity of exquisite patterns in wall papers and fabrics for which this firm is noted. Architects are given special consideration by the Tozer Company and members of the profession will find it greatly to their advantage to consult the firm when carrying out an interior decorative scheme, whether it be simple or elaborate.

New Depot.

The Key Route Company will erect a frame depot at Twelfth and Poplar streets, Oakland, Cal.

Artistic Sheet Metal Work.

Architects having need for sheet metal ornaments for lodge and club buildings should not overlook the San Francisco Metal Stamping and Corrugating Company, 296 Eleventh street, San Francisco. Several very clever sheet metal figures have been turned out by this concern, including a typical California bear for the Native Sons and an eagle which adorns the top of the new subpost office building on Stevenson street. An elk's head will probably be made for the new Elks' building at Bakersfield and the same design may adorn other Elks buildings in the state. The company is having a large sale of metal tile for Mission and Spanish houses, much of this material being shipped to various trans-bay points, including Oakland, Alameda and San Jose.

More Bank Buildings.

The Commercial Bank of Ukiah will erect a $10,000 building at the corner of School and Perkins streets in that town.

Chester & Darrow of Roseville have been awarded the contract for building the new First National Bank building at Auburn, the plans for which were drawn by Architect Fellows. The building will be two stories and will stand at the junction of three streets.

Terminal Hotel.

Architects William Curlett & Son are rushing work on the plans for the new Terminal Hotel to be erected on the north side of Market street, near East, San Francisco by the Pringle Investment Company, W. B. Pringle, president. This building will contain 250 rooms and will be of steel, brick and concrete.

Must Call for Bids.

A decision of general interest to contractors is that handed down by Judge Lewis in the Superior Court at San Diego in a friendly suit to determine whether a city or its official commissions have the right to execute public work by force account without first calling for competitive bids. The ruling was in favor of the contractors, who combined to test the right of the Boulevard Commission of San Diego to have certain work done by day labor or by awarding contracts to whomsoever the members of the board saw fit, without soliciting bids in the regular manner. Judge Lewis in his decision held in substance:

"That the case of San Diego City vs. Potter, decided by the Supreme Court of March 28, 1908, held that the authority for voting bonds under the act of February 25, 1901, was based on Section 26 of the Vrooman act. The court held that the Vrooman act is law paramount to the city charter, because the act was in force when the original charter was adopted, and that at that time the amendment to the Constitution in 1896, relieving the charter in respect to municipal affairs from general laws inconsistent with charters, had not been adopted. Under the Vrooman act all street work, even when it is done entirely out of city funds, must be in accordance with the decision of the Supreme Court and must be done by contract let after public bidding following advertising. Section 9 of the Bond act of February 25, 1901, under which the San Diego boulevard bonds were voted, provides for practically the same method for spending the money raised on bonds, and provides that the money shall be expended in the manner only prescribed in the act.

A Handsome Roofing Folder.

One of the most dramatic successes in the line of building materials is pictured in a handsome folder put out recently by the Keasbey & Mattison Company, of Ambler, Pa.

The folder illustrates twenty-six buildings roofed with Asbestos "Century" Shingles—from Rhode Island to Nebraska, from Wisconsin to Texas, beside a residence in Porto Rico.

These shingles, as most architects and builders are aware, are composed of a concrete of cement and asbestos fiber, compacted and formed into slate-like sheets under tremendous hydraulic pressure. They are applied like any ordinary shingles or slates, being nailed either to a rough sheathing, or (cheaper but less desirable) directly to the lath.

Members of the trade who are not in touch with what is destined to be the greatest development in building materials are advised to write the Selling Agents for their folder.



An Index to the Advertisements

[Index continued on Page 103.]

"Butcher Boston Polish."

This name is probably better known to architects, builders and house owners throughout the country than any similar polish used by the polishers of floors, interior woodwork, etc.

It has the reputation of being about the best floor finish made, and has no objectionable features. It is not brittle and will not erase like shellac or varnish, nor is it soft and sticky like beeswax; while perfectly transparent and preservative of the natural color of the wood. It is easily applied and anyone can use it. Without doubt this is the most economical and satisfactory polish for hardwood floors.

The firm has just issued a little booklet, which gives full information, regarding the various kinds of polish they manufacture. It gives some very interesting data on polishing new floors. Any of our readers can obtain a copy by addressing Butcher Polish Co., 356 Atlantic avenue, Boston, Mass.

Approve Hotel Plans.

The stockholders of the Oakland Hotel Company at a meeting in the Oakland Clearing House approved the plans for a Bankers' hotel at 13th and Alice Street, covering a ground space of 150x200 feet. The project is to be capitalized at $3,000,000, of which $1,000,000 is to be preferred stock and $2,000,000 common stock, and an authorized bond issue of $75,000, of which $40,000 will be underwritten at the present time. Oakland bankers will handle the bond issue. The building is to be a class-A structure. It will contain 300 rooms, a lounging room, office, ball room, dining rooms, kitchen, reception hall, barber shop and a banquet hall to seat 800 guests. The building will occupy 150x200 feet of ground space, the other 150x200 feet of property owned by the company to be converted into a sunken garden. Bliss & Faville, of San Francisco, are the architects and they soon will be ready to let contracts.

Immense Public Market.

Architects Dennis & Farwell, of Los Angeles, have prepared preliminary sketches for an immense public market house to occupy a central location in that city. It will contain both wholesale and retail departments, and will be thoroughly sanitary in every department; also cold storage facilities and conveniences for handling dairy products. The perspective shows a building of fireproof steel frame construction, two stories high, of imposing dimensions, and with a central tower which will contain offices.

Waterhouse & Price Take Agency.

The Hausmann Sash Carrier Company has decided to move to New York City where the business will be conducted under the present management. The Waterhouse & Price Company, 59 Third Street, San Francisco, and Los Angeles and Portland, will represent the company as sales agents on the Pacific Coast. Messrs Waterhouse and Price have recently refitted their San Francisco salesrooms in a most attractive manner.

San Leandro School.

The town of San Leandro is to have a new school building to cost $60,000, from plans to be selected by competition. C. H. Miller is clerk of the School Trustees.

ADVERTISERS' INDEX—Continued from Page 105

Prof. Derleth Remembered.

The new clubrooms of the San Francisco Architectural Club in the Commercial building were the scene of a very enjoyable jinks given by the class in structural engineering of the club to their instructor, Professor Charles Derleth Jr. of the University of California.

The occasion was the completion of the course of weekly lectures which has extended over the period of a year and a half.

The appreciation of the class for the good work done by Professor Derleth was shown by the presentation to him of a handsome set of book racks carved in rosewood and mounted with a silver plate bearing an appropriate inscription.

An interesting musical programme was rendered during the evening by the following members: Messrs. Corking, Magee, Lowe, Brandlein and King.

The following members very ably responded to the call of Toastmaster Lapachet: Professor Derleth, Messrs. Headman, Magee, Sawyer, Johnson, Wagner, Farnkopf and Corwin.

Messrs. Greenwood, Sawyer and Magee, the committee of arrangements, deserve credit for the unqualified success of the affair.

Praise for Samson Spot Cord.

The following letter, addressed to the Samson Cordage Works, Boston, Mass., is self-explanatory:

"Gentlemen: We have been using your Samson Spot Cord in the Weightman properties for a period of eight (8) years, during which time we have not had to replace or renew one broken cord of the Samson variety. This to us is a remarkable record, considering the experience we have had in the past with other sash cords we have used. Yours very truly,

"JAMES S. TALLEY.

1934 Commerce St., Philadelphia.

Gymnasium at Mill Valley.

The committee in charge of the Mill Valley Boys' Club has leased the old town hall and will convert the same into a gymnasium and clubrooms for the Boys' Club. Apparatus, lockers, baths, etc., will be put in. Members of the committee are O. C. Cappleman, H. C. Symonds and C. J. Du Four, all of Mill Valley.

Peerless Laundry Trays.

The Peerless Manufacturing Company reports a good demand for the Peerless tray, which is unquestionably one of the best-built cement trays on the market to-day. Quality counts, and to this end the company uses the very best cement obtainable and employs the highest priced mechanics. The Peerless people have a well-equipped plant at 364 Eleventh street, San Francisco, with facilities for turning out from sixty to seventy trays a week.

Hardwood Floors.

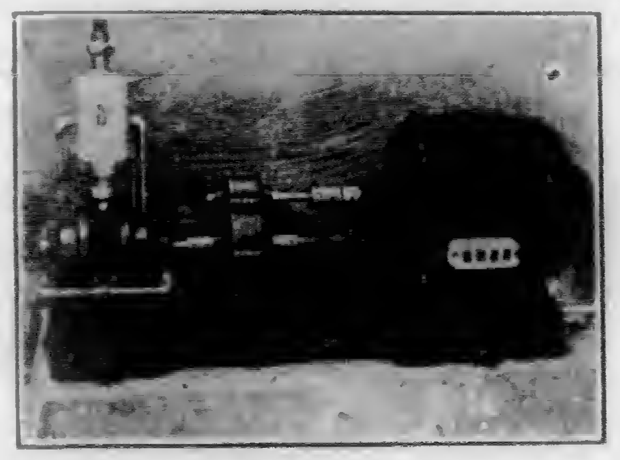
The Hardwood Interior Company of 873 O'Farrell street, San Francisco, has laid maple and oak floors in many of the most prominent buildings in San Francisco since the fire three years ago. Among these buildings are the Fairmont hotel, Butler building, Whitney building, Crocker building, Emporium, White House, Sloane, Magnin, Lilienfeld and Sachs buildings, besides a number of palatial residences in Oakland, Berkeley, San Mateo, Burlingame and San Jose.

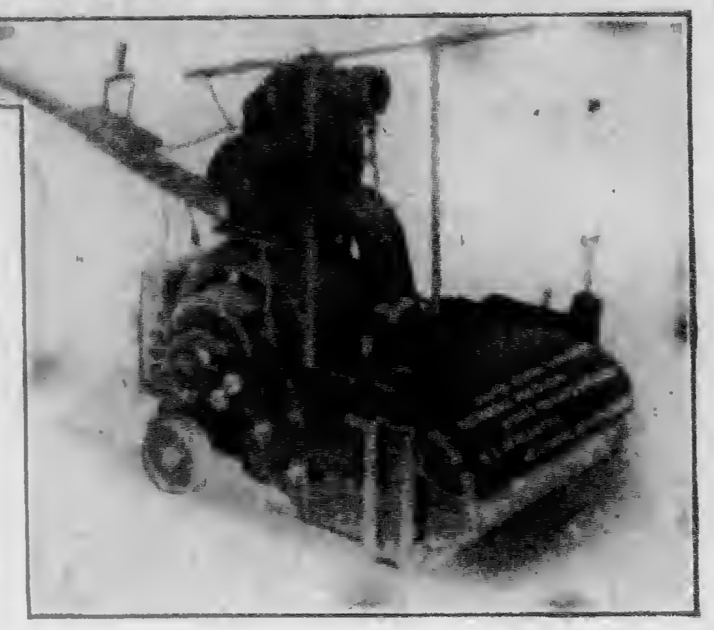
Good Roads Wanted in California.

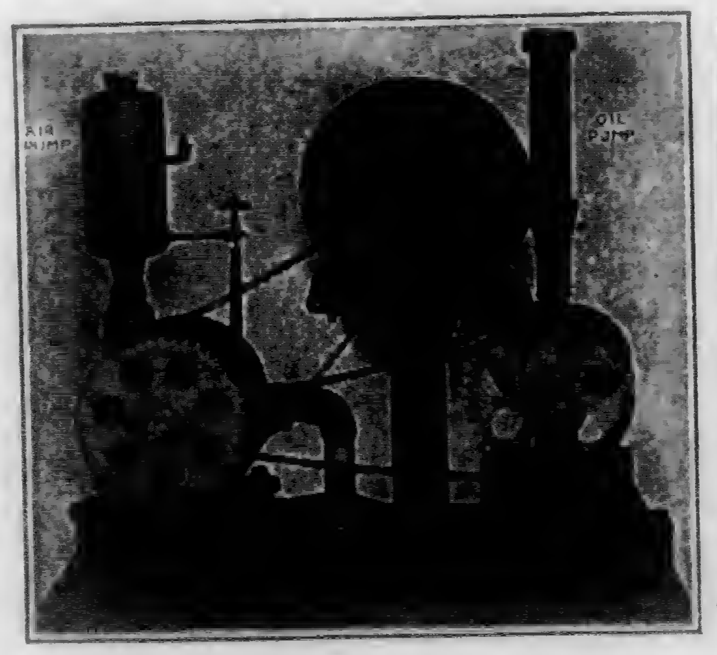
Governor Gillett is trying to have a measure passed that will provide a fund to establish State roads connecting all important points in California. The measure proposed is a good one, and it should pass as originally drafted and without amendment. It provides that $18,000,000 be laid aside for road construction. This road construction will in no way interfere with the mud hillocks now being put up as roads by the various counties, but it may act as an example of what good road building should be, for the intention is to import the services of a United States expert in roads and have him coach the builders as to the best use to be made of the local materials.

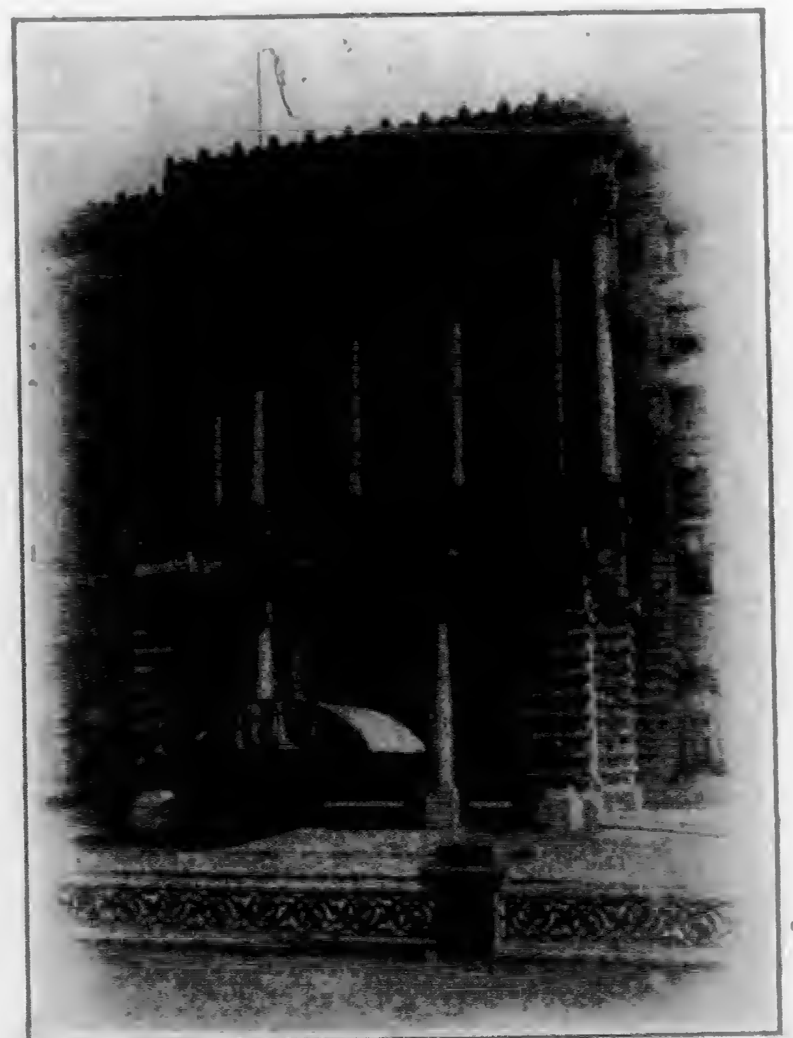
In a recently published pamphlet issued on the subject of good roads it is reported that in one of the central counties of California the sum of $525,000 was expended by the road, or county, commissioners in one year, and the further statement is made that this particular county has no roads worth the name. It must be remembered also that immense sums of money had preceded the amount mentioned. This is true of one county, and it may be said that it is practically true of all the counties in the State.—Municipal Engineering.

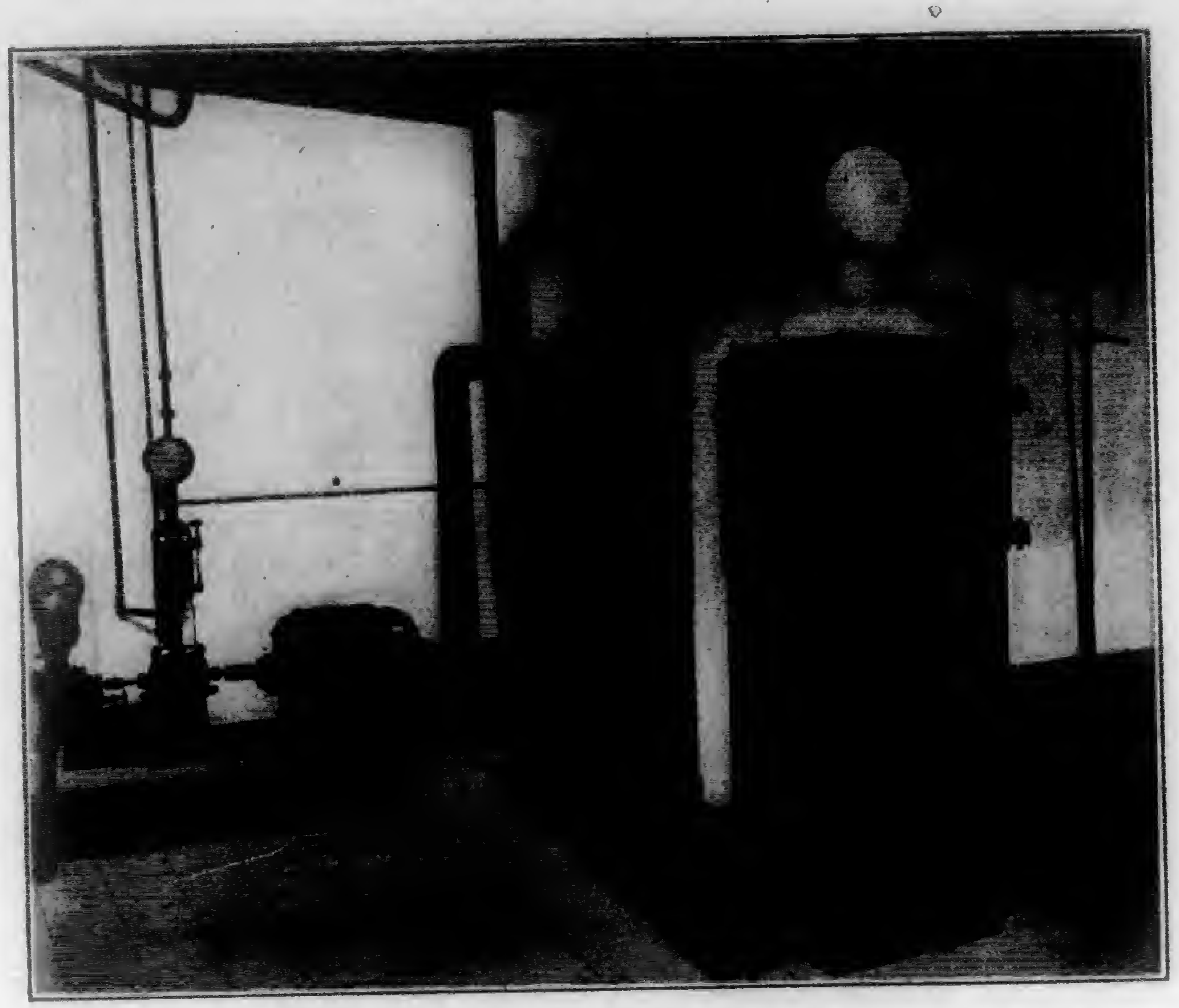












Direct Driven Air Compressor and Oil Pump Installed in the Merrill Building San Francisco.

THE NEWEST THING IN OIL-BURNING PLANTS

THE above illustration shows a direct driven air compressor and oil pump fitted with automatic oiling device, recently installed in the Merrill building at 122 Kearny street. San Francisco, by the G. E. Witt Company, manufacturers of high-class low pressure automatic oil burning systems. The Merrill building is a seven story, store and loft building designed by Architect Clinton Day. The oil burning apparatus in this building is one of several similar up-to-date plants installed by the Witt Company in pretentious San Francisco buildings the past twelve months.

The machine illustrated above has only two bearings to lubricate, which are automatically oiled. It has no expensive chains or sprockets to replace, no worm gears to wear out, no loss of power for transmission, and saves from two to twenty per cent of the power over the other machines where the above mentioned transmissions are used. It is self contained, lasts much longer, costs fifty per cent less to maintain, requires twenty-five per cent less oil for lubrication, less floor space, is more accessible, for packing or repairing than any other machine on the market, is simplest to handle, requiring no experienced operator. There is no noise or vibration.

It has a low speed motor which has plenty of excess power and while it is more expensive, it will last longer than a high speed motor.

Low pressure plants have been installed in the following buildings:

Hamlin Hotel, Goodyear Rubber Co., Madison Burke Co., Taft Pennoyer Co., Cosmopolitan building, Gunst building (Third st.) Gunst building (Powell st.), Hotel Regent, Brilliant Hotel, Carmelita apartments, Gustave Sutro building, Sherman Clay building, Callaghan building, Cornelia apartments, Home Telephone building, Bush and Fillmore streets; Koshland building, Cuneo Bros., Murphy Grant building, Mary S. Merrill building, Home Telephone building, Grant avenue; Armand-Cailleau building, all in San Francisco; Producers' Bank building, Bakersfield: Fresno Republican Co.'s building, Fresno; Elks building, Stockton: Stockton Bank, Stockton; Modesto Court House, Modesto; Haverty Co., Los Angeles; Gearhardt Oil Burner Co., Fresno.



Hewes Building, San Francisco.
Reid Bros., Architects.

This splendid store and office building has Makowski Plaster Block Partitions.



Partitions as Erected in Hewes Building, San Francisco.
Reid Bros., Architects.

A NEW FIREPROOF PARTITION BLOCK.

ARCHITECTS in search of an ideal partition material will do well to visit the David Hewes building at Sixth and Market streets, San Francisco, Reid Bros., architects, where the interior is in course of completion. What is known as the Makowski Plaster Block is being used in the partition construction, and those who have inspected the work predict a big demand for the blocks in the future building operations of the city.

Made of pure gypsum, the blocks are equivalent to a hard wall plaster and at the same time dispense with all studding and lath work. They can be manufactured any size and are easily handled and put together. The block wall in position weighs about one-half as much as the wood studding with lath and plaster, and is absolutely fireproof. The weight does not exceed eight pounds to the square foot. The time consumed in erection is less than for any other kind of partition, only a putty coat of plaster being necessary to finish the job. They are more nearly sound proof than any other class of partitions.

The blocks are much cheaper than hollow tile or concrete partitions required in class A buildings, yet they answer the same requirements supplied by either of these two materials. The blocks are made at the Plaster Block Company's factory at Second and Townsend streets, now being enlarged, or on the job. They are 3½ inches thick without the finish coat, the latter giving them a total thickness of 3¾ inches.

The blocks are especially desirable for partition work in apartment houses, hotels and all class C buildings. They dry out quickly and, besides being impervious to fire, are always clean and sanitary. One feature about the Makowski block is the absence of grease, insuring thereby a dry surface to which the finish white coat will adhere quickly and permanently.

The company intends to install a plaster board machine which will turn out a plaster board that will require no finish coat. The boards will be so constructed that they can be readily nailed to wooden partitions, ceilings or wherever lath and plaster are required.



Partitions as Erected in Hewes Building, San Francisco.
Reid Bros., Architects.

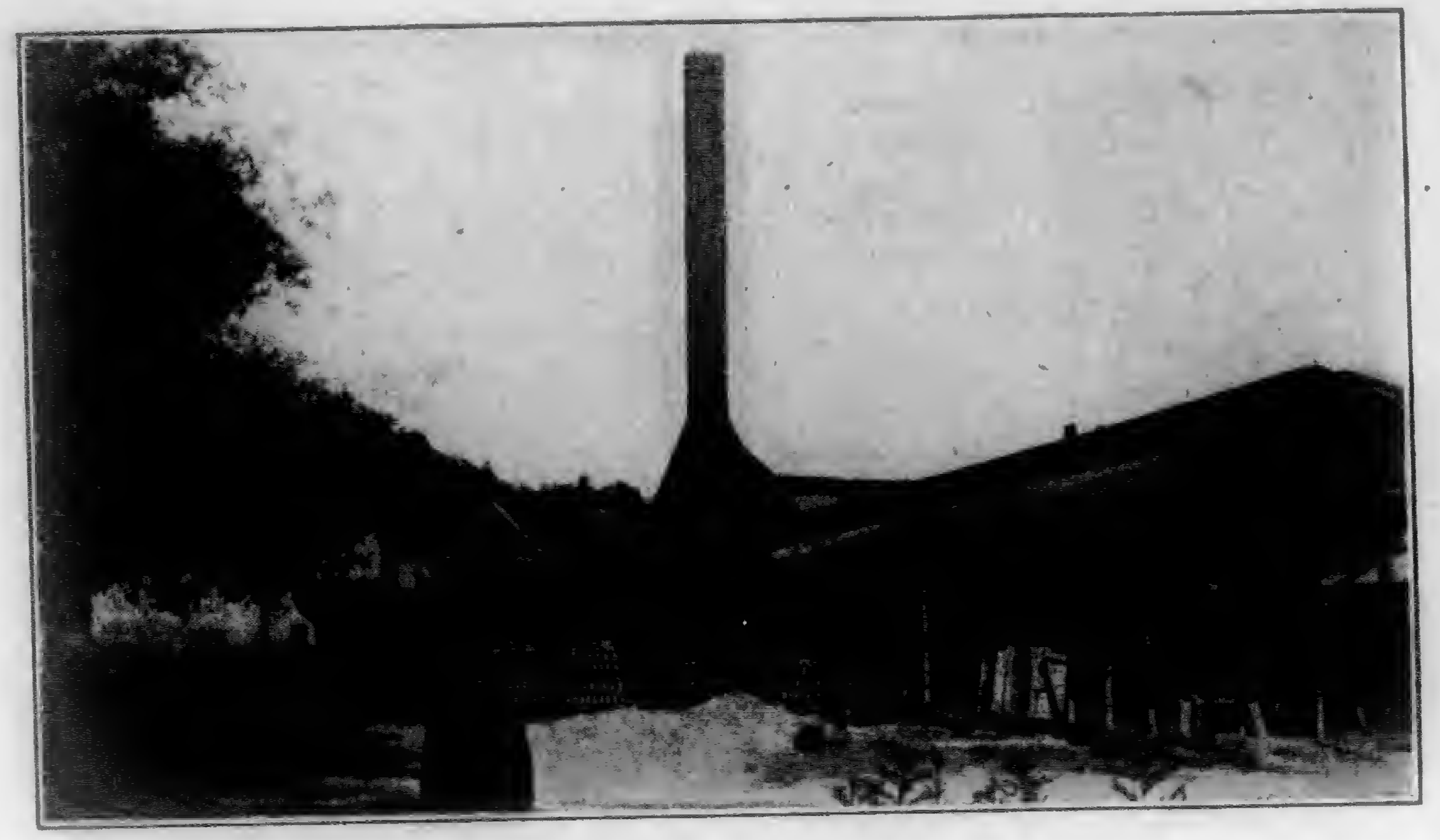
The municipal authorities of San Francisco have taken considerable interest in the invention, and it is very probable that a law will be enacted making block partitions a standard construction because of their light weight and fireproof qualities.

Fine Piece of Concrete Work

One of the best pieces of reinforced concrete work recently finished in California is that done by the Rickon-Ehrhart Engineering and Construction Company, being the new town hall at Berkeley, designed by Architects Bakewell & Brown of San Francisco. The mixing and pouring of the concrete was carefully supervised by an expert superintendent, and the result is an almost perfect piece of cement work. Other notable contracts taken by this company include the Sonoma County Court House, the Industrial Home for the Blind, the fire station at Twenty-fifth street and Broadway, Oakla d, two buildings at Agnew, the Lick Baths, the sewage pumping plant at Sacramento, and the Farmers and Merchants Bank building of Oakland.

Savings Union to Build.

Architects Bliss & Faville of San Francisco have plans for a fine bank building for the San Francisco Savings Union. The drawings call for a classic structure with a huge dome. The entire exterior, including the dome, will be of white stone, the entrance door and the window grills will be of antique finished bronze.



View of the Plant.

THE PURE CLAY BRICK AND TILE COMPANY

THE illustrations shown on this page and in the advertisement elsewhere in this issue of The Architect and Engineer give the reader a fair idea of the size and capacity of the splendid plant of the Pure Clay Brick and Tile Company of San Francisco. Equipped with the best machinery and possessed of superior clay deposits, the company is in position to manufacture a high-grade brick and ship same to almost any point in the state on short notice. The plant is at Hilton, Sonoma county, and has ample transportation facilities. Both the common and pressed brick are turned out, and machinery is now being installed for making an especially fine pressed brick and tile. The plant at present gives employment to forty-five men, which number will be increased as new machinery is put in operation. The present capacity of the plant is about one and one-fourth million brick per month.

Mr. O. J. Crossfield is president of the company and Mr. E. Aigeltinger is vice-president.



Another View of the Plant.



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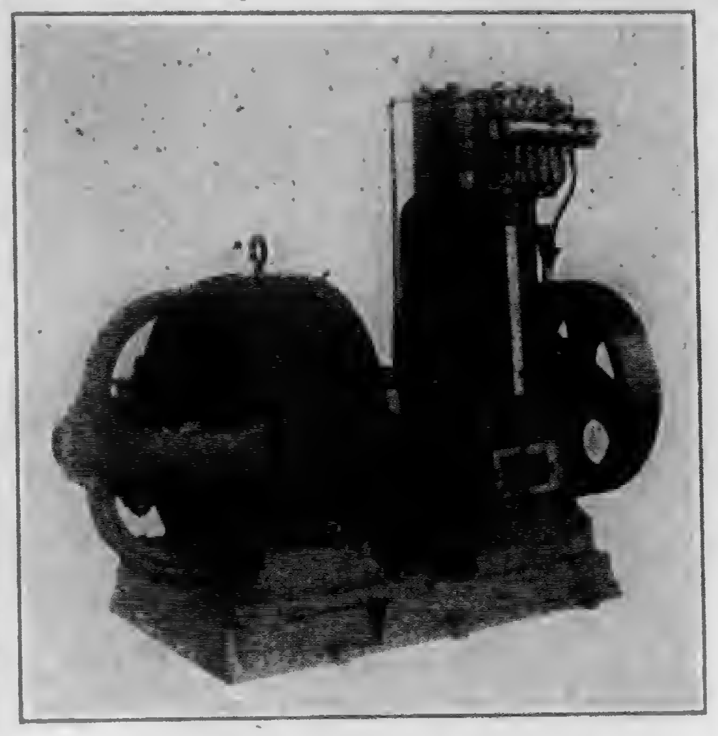
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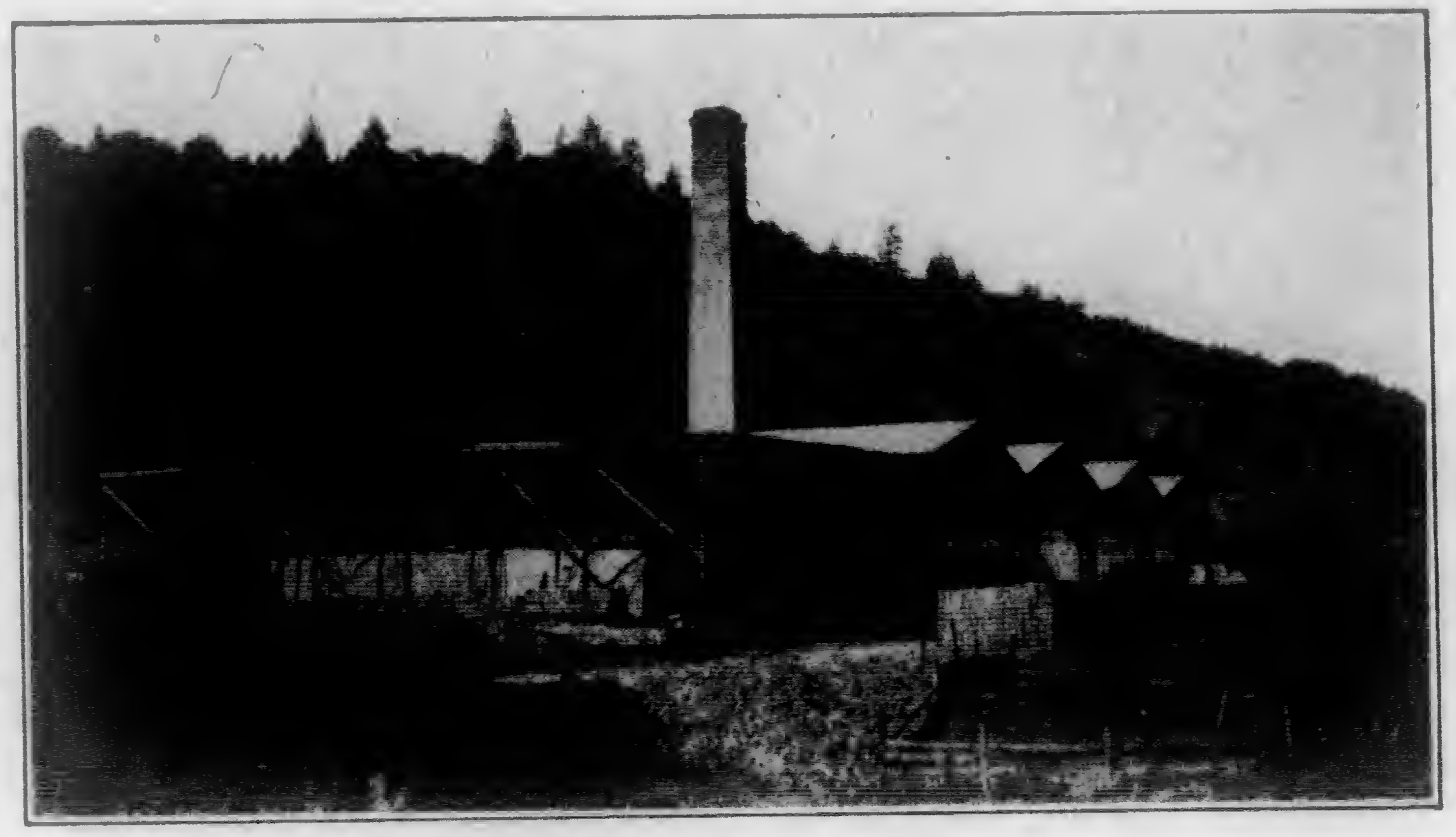
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Their imitation granite can also be made in different shades plain or ornamental, in slabs, mouldings or bases.

Their interlocking concrete blocks are very desirable for outside walls. They can be supplied with a finished face, chamfered, rustic, rock-faced or granite-faced.

The company will be glad to quote prices on any of the above and will guarantee the products to be just as represented. Samples will be furnished upon application, or can be seen at the company's office, 24 California street, San Francisco.

Increasing Use of Philippine Mahogany.

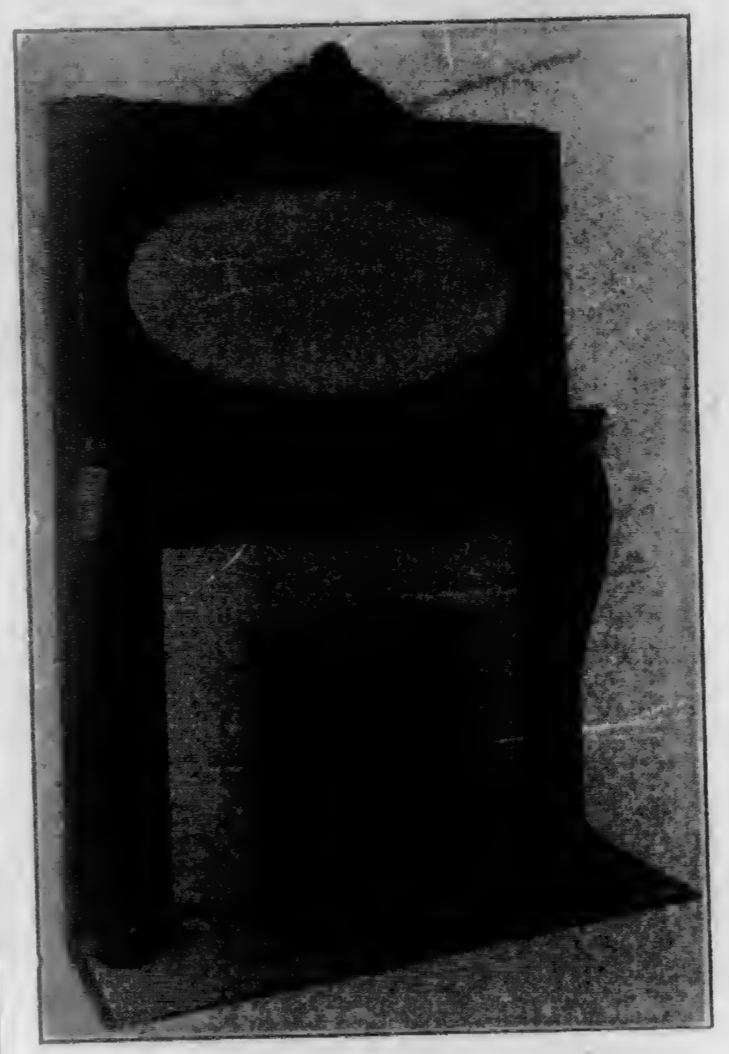
Although Philippine mahogany is a comparatively recent factor in the hardwood industry of this country, it seems to have jumped immediately into favor. Seattle has taken almost a million feet within the last year and a half. San Francisco has not used more than half that amount, being more conservative in taking up new woods, but now that the worth of this product of the Philippine forests has been conclusively proven, its use is becoming very general. The street railway company of Cleveland, Ohio, has ordered a large quantity of Philippine mahogany for the interior trim of their street cars, its long lengths making it especially valuable for this purpose. One San Francisco firm imported 100,000 feet in February and has another 100,000 feet to arrive on the Manchuria shortly. The wood seems to fill a long felt want in the wood-working business, namely, a good mahogany at a cheap price.

White House Renovated.

When William Howard Taft stepped into the White House at noon on the 4th of March as the new President of the United States of America he found a model home, equipped with every modern convenience; this is what other presidents have never enjoyed. Before the election of President Roosevelt few changes had been made in the White House since the days of John Quincy Adams, when it was rebuilt after being fired by the marauding British troops, only the walls being left standing.

The executive mansion, as it was called before the advent of Mr. Roosevelt (he dubbed it officially "the White House"), was the first public building erected at the seat of government. The architect was James Hoban, who drew his plans closely after those of the seat of the Duke of Leinster, near Dublin, Ireland. George Washington himself selected the site, laid the corner stone on October 13, 1792, and lived to see the building completed. John Adams, however, was the first President to occupy it, which he did in 1800.—Technical World Magazine.

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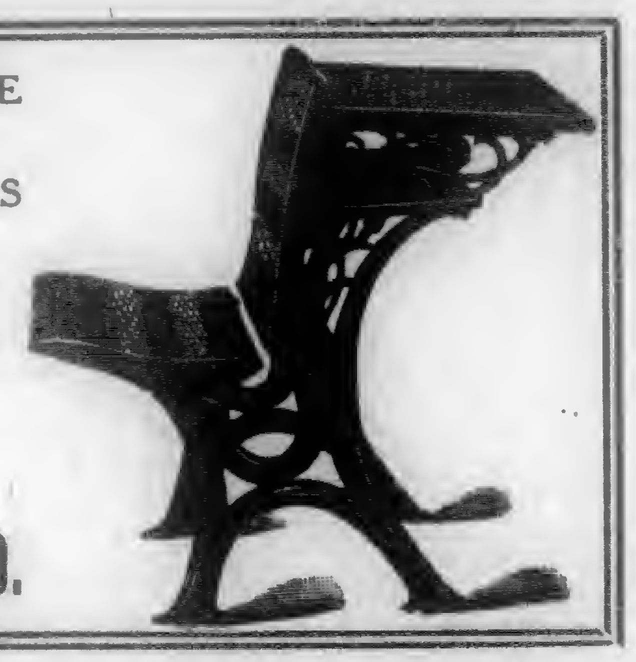
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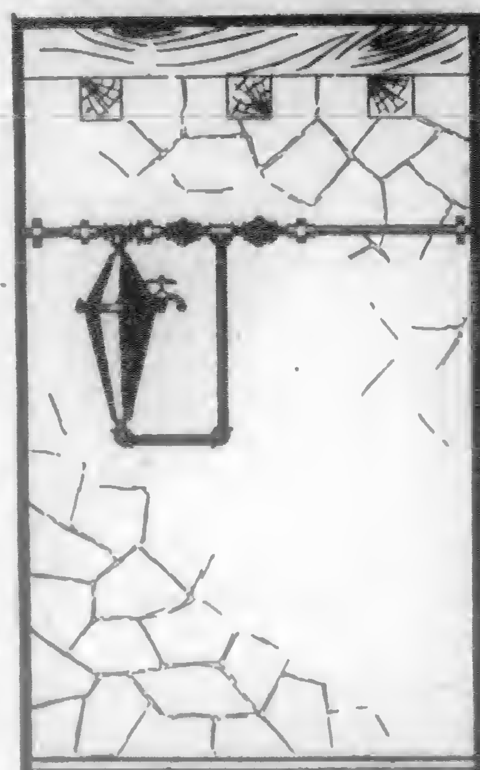
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NOTICE TO CONTRACTORS

Washington, D. C., U. S. A.,
May 8, 1909.

The Chinese Government, through its representatives, invites sealed proposals for the erection and completion of a group of buildings to be used as a Bureau of Engraving and Printing in Peking, China, in accordance with plans and specifications prepared by Architects Milburn, Heister & Co., Home Life Bldg., Washington, D. C. Said plans and specifications will be on file on and after May 15th at the following places:

Architects' Office, Washington, D. C.
Chinese Consulate, New York City.
Chinese Consulate, San Francisco, Cal.
Chinese Legation, London, England.
Chinese Legation, Berlin, Germany.
The Ta Ching Government Bank, Peking, Tientsin, Shanghai, Canton, China.

Bids from America and Europe must be filed with the Chinese Legation at Washington, D. C. on or before July 15, 1909. Contractors figuring on this work are requested to submit separate proposals for each or a part of the following main headings:

1. All buildings complete, including all excavation, concrete work, mill work, etc., required in connection with the mechanical plant.
2. All work as shown by the plans and specified under the head of Mechanical Plant.
3. All steel lockers, as shown and specified, press room busses shown on sheets Nos. 30 and 31, benches and tables specified for the fourth floor dining room, and tank in wetting room on second floor.

Contractors wanting to figure on the separate parts of the work are requested to file their bids at the same time and place as the bids for the work as a whole. Each proposal shall be in sealed envelope and marked plainly "Bid for work for Chinese Bureau of Engraving and Printing, Peking, China."

The successful contractors are given notice that they will be paid 80 per cent on the work as the same progresses, retaining 20 per cent until final completion and acceptance. Each contractor is given notice that he will be required to give a guarantee company's bond, payable to the Chinese Government, in sum of 50 per cent of the contract price, for the faithful performance of his part of the work, should his bid be accepted.

The Chinese Government reserves the right to reject any or all bids. All inquiries in reference to the work should be addressed to the Architects.

To Add More Stories.

The directors of the Oakland Bank of Savings are arranging to increase the height of their new six-story building at the northeast corner of Broadway and Twelfth street to eight stories. Plans for the addition have been prepared by Architect C. W. Dickey, who estimates that the cost of the alterations will be approximately $100,000.

Lime putty does not make good mortar unless it is sufficiently ripened as putty. When there is no time to wait, or no place to keep the putty, it is better to use hydrated lime, which is a ready-made putty for instant use, or about that. It is just as well to begin now to consider the use of the hydrated as the modern way of handling lime intelligently and economically.

Dyer Bros. Not Strong for Home Industry.

(From the San Francisco Call.)

Dyer Brothers protested at a meeting of the State Harbor Commissioners against the exacting nature of the test to which the steel supplied for use in the construction of Pier 38 is subjected. Steel that had been rejected by the State inspector, said Dyer, had been declared all right by the Union Iron Works. He urged that the specifications were unfair to the Eastern manufacturer, who could not make steel to fulfill such requirements.

President Stafford gave the steel man little comfort, saying that Dyer as a subcontractor had no standing before the board.

"I cannot share your sympathy for the Eastern manufacturer," said Stafford. "His inability to make the kind of steel that will stand our test may be a good thing and may lead to the establishment of some good rolling mills on this Coast. We have every confidence in the fairness of the test and the ability of our inspector, and you will have to satisfy him or prove to us his unfitness."

Denny-Renton Extensions.

Plans which have been under consideration for many months by the Denny-Renton Clay and Coal Company of Seattle, calling for extensions and improvements to cost $300,000 have been approved, and work is now proceeding at the Renton paving brick plant with the excavation for the erection of five additional square, large-type, down-draught kilns.

These kilns are similar to those erected by the company last summer and are the largest down-draught kilns in the United States. Each measures 150 feet by 20 feet inside and holds 300,000 paving brick, or a total additional holding capacity of 1,500,000 brick. This is equivalent to an additional daily output of 50,000 bricks. These five kilns will cost $100,000. To meet this kiln capacity the factory will be enlarged and new machinery installed at a cost of $50,000.

The constructors must finish this work by July 1st, thus enabling the firm to take care of an unusually heavy demand for vitrified brick this year.

In making this improvement the company thought it wise to build for the future. It has been found that the delivery period, in which work can be successfully prosecuted each year, is short, and all work is pushed during that time. Winters such as the last one are too severe to operate continuously. These difficulties have been given due consideration, and it was decided to build on such an elaborate scale as to meet any such emergencies.

"With only 47,000,000 paving brick now laid in the State of Washington," said the general manager, "we will have an annual factory output of 45,000,000 pavers, and thus be prepared to cope with every possible demand upon us for years to come. Our faith in the continued prosperity of Seattle and the Northwest is good and sufficient reason to warrant this expenditure."

Slight Mistake.

"Oh," exclaimed the fair boarder, as a couple of calves scampered across the meadow. "What pretty little cowlets!"

"Yew air mistaken, ma'am," said the old farmer; "them's bullets."

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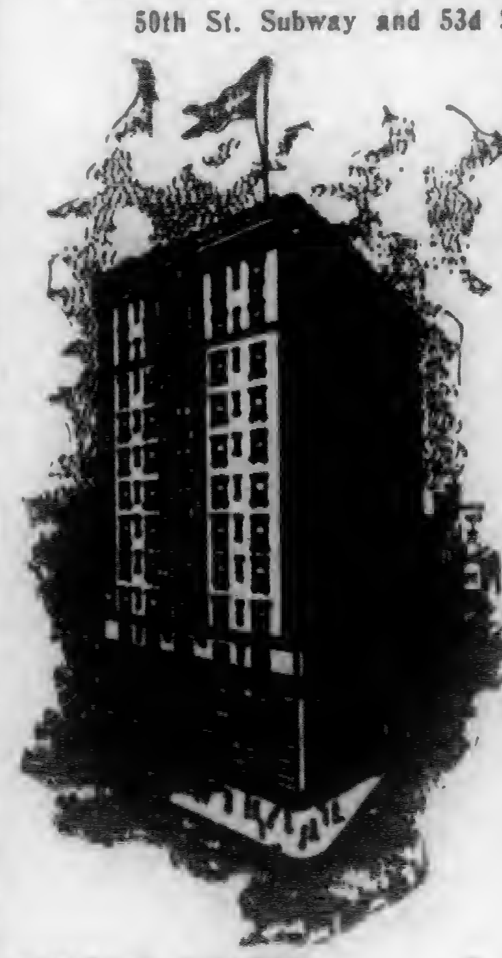
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Artistic Bronze Work.

One of the busiest houses in the manufacture of builders' specialties in San Francisco is the Keystone Ornamental Iron and Bronze Works, of 350 Tenth street, of which Mr. Ira G. O'Brien is the proprietor. The factory is busily engaged in filling orders, for the firm's reputation ensures a steady business at all seasons.

The firm has just completed some beautiful bronze work for the new Post-street store of Rosenthal & Co., the shoe dealers. Mr. L. P. Hobart, the architect who designed the interior decorations for the store, selected bronze as best adapted to the decorative scheme, and this metal is to be used extensively.

A most striking piece of bronze work is a show case situated just inside the store entrance. It is of solid bronze, eleven feet long, five feet wide, and as many feet high, with heavy French plate glass mirrors, which will reflect the beauties of the goods displayed within. The case will contain samples of footgear from the factories of the leading European and American shoemakers.

For beauty of design and high-class workmanship the show case is the most artistic and costly yet produced by any concern on the Pacific Coast.

The Keystone Ornamental Iron and Bronze Company will also make five bronze signs for the exterior of the same store, which for beauty will be in harmony with the interior decorations.

The Architect and Engineer
of California
Pacific Coast States

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Contents for July

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Albert Pissis.

Frontispiece,
The Architect and Engineer of California
July, 1909

THE

Architect and Engineer

Of California

Pacific Coast States

THE ALBERT PISSIS NUMBER

VOL. XVII. JULY, 1909. No. 3.

The Work of Albert Pissis, Architect.



MUCH of this issue of The Architect and Engineer is devoted to the work of Mr. Albert Pissis, an architect who has been responsible for more graceful, dignified and well-planned structures on the streets of San Francisco than any single practitioner in the Bay City. That Mr. Pissis has enjoyed the best clientage in San Francisco one need only to glance at his splendid work to be convinced. Instinctively one feels that the owners or trustees back of each enterprise with which he has been associated were men of parts, of discernment, of liberality and of taste.

In finance and real estate it is customary to speak of the most choice properties and securities as "gilt-edged," those that are the very best—the cream, so to speak. Not a few of the buildings erected by Mr. Pissis belong to this class. In them one finds no hampering, no stint of outlay, no pinching or compromise to eke out the returns. Expenditure, while lavish, is wisely made, and the result achieved is justly a matter of personal pride, so that some of the buildings are almost monumental in their massiveness. Few cities of the same size have so many magnificent business blocks. In such cases the professional zeal of an architect is less needed, but larger demands are made on his knowledge, and the command of himself becomes an important factor, lest, with superabundance of possibilities, his judgment be dumfounded, as Horace put it: "Copia judicium saepe morata meum."

These cases are exceptional in any architect's experience, and entirely foreign to most. How, then, can one account for the fact that, by external evidence alone, all the buildings here shown are what might be called first-class; how account for the fact that so many of them are of stone, in a country where stone is not cheap, and that they are of stone clear up without compromise of copper or admixture with brick. How account for the fact that they are not merely of stone for the sake of saying so—a thin skin of ashlar with the weakest of reveals and the minimum of mouldings, as some of our buildings are—but built with full jambs and deep soffits almost Roman in their boldness,

*Mr. Pissis is a Fellow of the American Institute of Architects, and president of the San Francisco chapter of that society. A number of illustrations shown in connection with Mr. Pissis' work were taken from the only available prints published before the San Francisco fire in 1906, and consequently are not as clear as others reproduced from photographs.



Albert Pissis.

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July, 1909

THE

Architect and Engineer

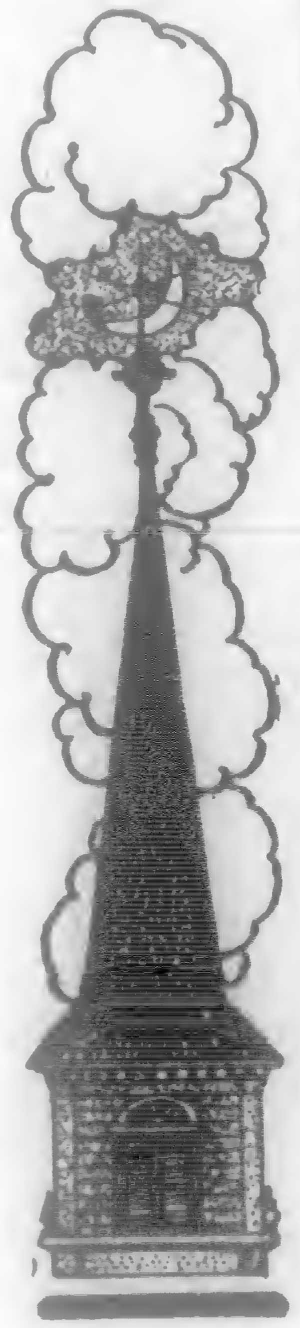
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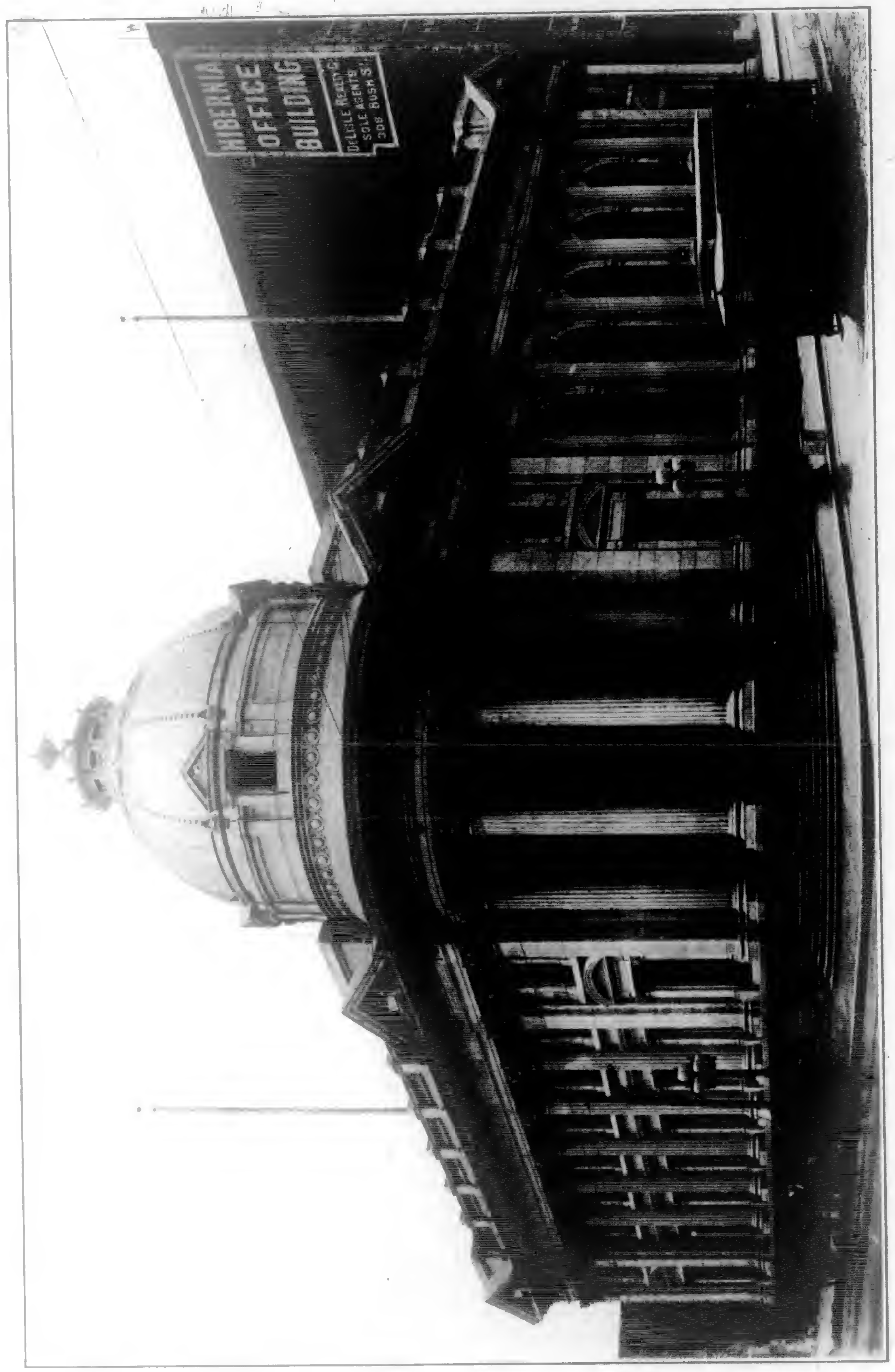


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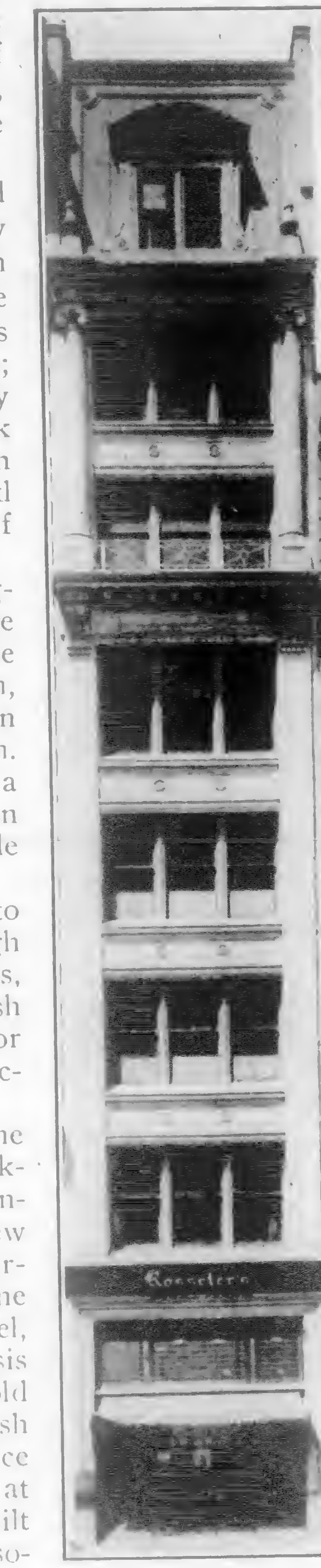
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Hibernia Bank Building, San Francisco Albert Pissis, Architect.

with full treatment of order upon order and cornice over cornice, in a way that is so dignified, so complete, so satisfying to the eye of the architect?

How is it, again, that a personal inspection reveals the fact that all Mr. Pissis' buildings are carried out to the last detail with that finish and completeness that shows no flagging of interest, no compromise, no ragged edges, so to speak; no place inside or outside where one can point the finger of the fault-finder and say, "There is an omission," or, "Here is a mistake," as one can do in so many large buildings?



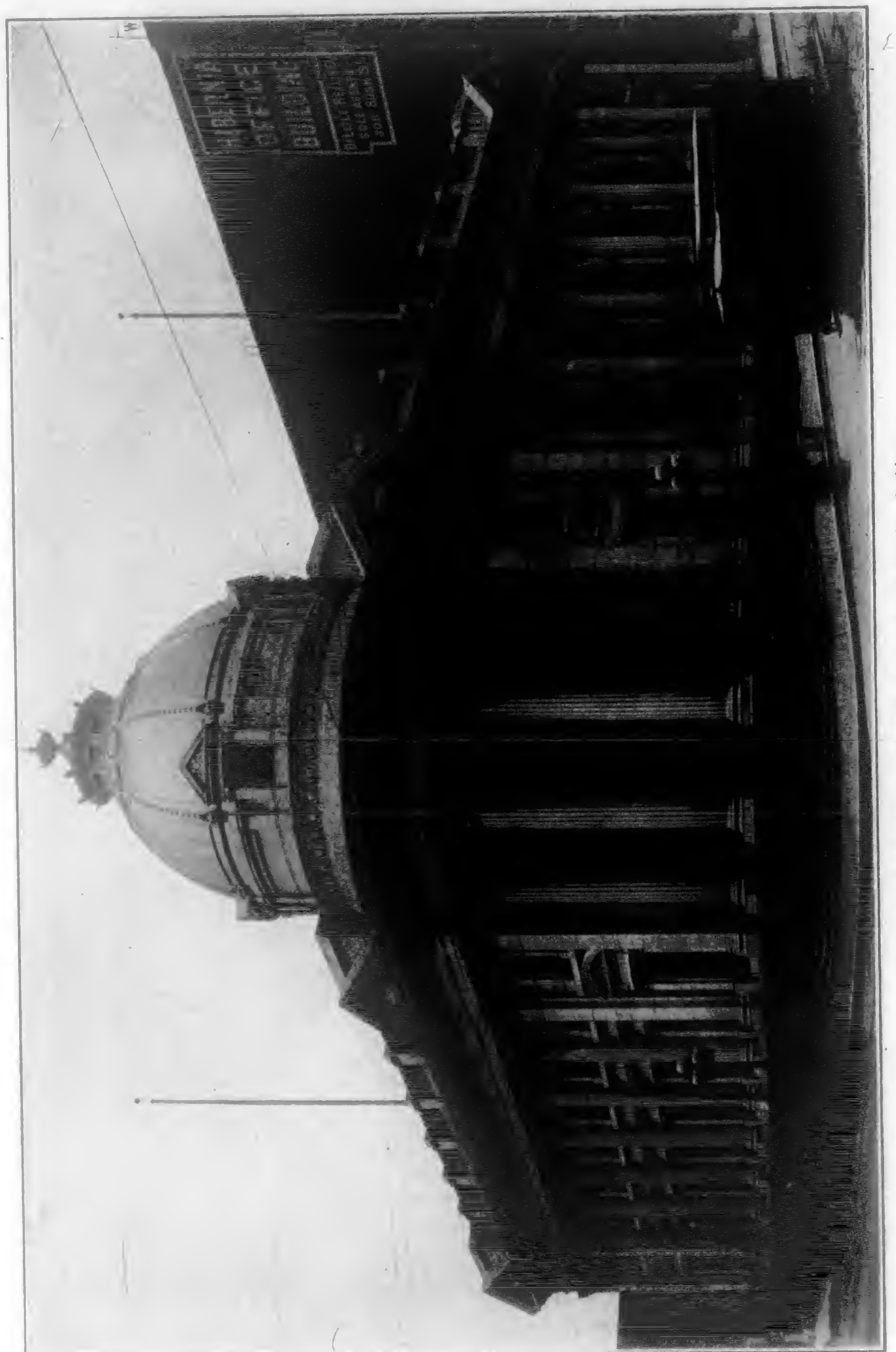
Roullier Building

Good architecture is to be judged by finished buildings, and by no other tests. The mere ability to design well, the mere wish to preserve a high standard, the most strenuous efforts to enforce the conditions of the building contract, even the limitations in the outlay—all these things cut little or no figure; the building alone counts. By this test, and not by what might, could or would have been done, the work of Albert Pissis is admitted to be pre-eminent in San Francisco. Mr. Pissis' remarkable success is attributed largely to professional loyalty and that delicacy of perception which is the basis of talent.

Mr. Pissis leans toward the classic style, suggesting Italian models rather than any other, or the columnated Palladian type which characterized the Beaux Arts projects a generation ago, and which, after all, are more restful, dignified and pleasing than the later efforts toward rationalism and radicalism. The buildings of the Chicago fair were also, in a sense, the fruits of the same impetus. For this reason Mr. Russell Sturgis has called this "a retrograde movement."

The reader will note the constant adherence to one style in nearly all Mr. Pissis' buildings. Although the period presented extends over twenty-three years, there is no material change in manner to distinguish the Hibernia Bank from the James Flood building or the Mechanics' Institute building now under construction.

The calm magnificence of the Emporium and the florid grandeur of the Flood building are both in striking contrast to the graceful decorum of the Rosenstock building or the indefinable elegance of the new White House. The Wheeler residence in the university grounds might be a villa in sunny Italy. The cold austerity of the interior of the San Mateo chapel, chastely beautiful as it is, is yet the very antithesis of the warmth and the many colored walls that uphold in azure and amber and gold the dome of the Jewish synagogue. One of the first buildings of importance intrusted to Mr. Pissis was the Hibernia Bank at Market and Jones streets. This structure was built in 1898, at which time Mr. W. P. Moore was associated with Mr. Pissis. After the fire the building



Hibernia Bank Building, San Francisco Albert Pissis, Architect.

with full treatment of order upon order and cornice over cornice, in a way that is so dignified, so complete, so satisfying to the eye of the architect?

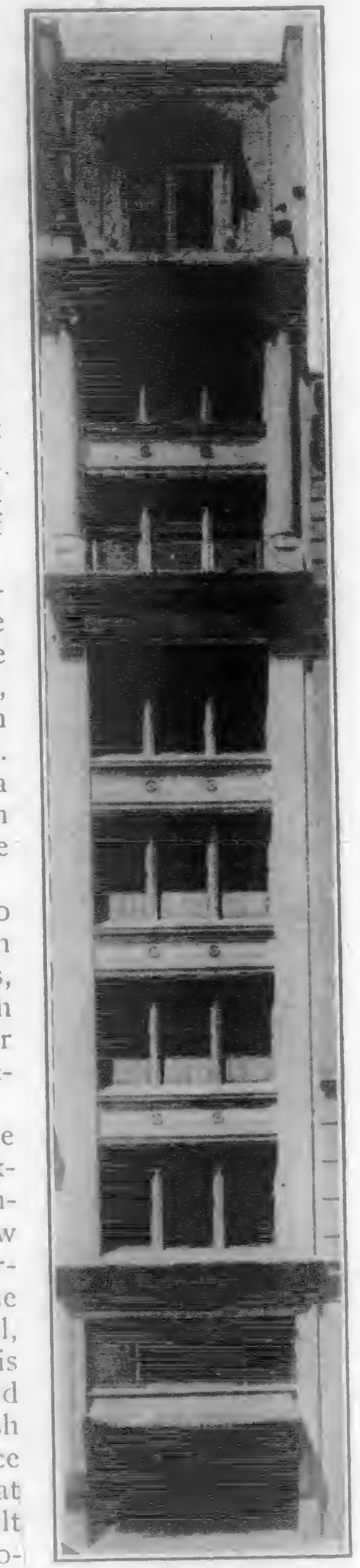
How is it, again, that a personal inspection reveals the fact that all Mr. Pissis' buildings are carried out to the last detail with that finish and completeness that shows no flagging of interest, no compromise, no ragged edges, so to speak; no place inside or outside where one can point the finger of the fault-finder and say, "There is an omission," or, "Here is a mistake," as one can do in so many large buildings?

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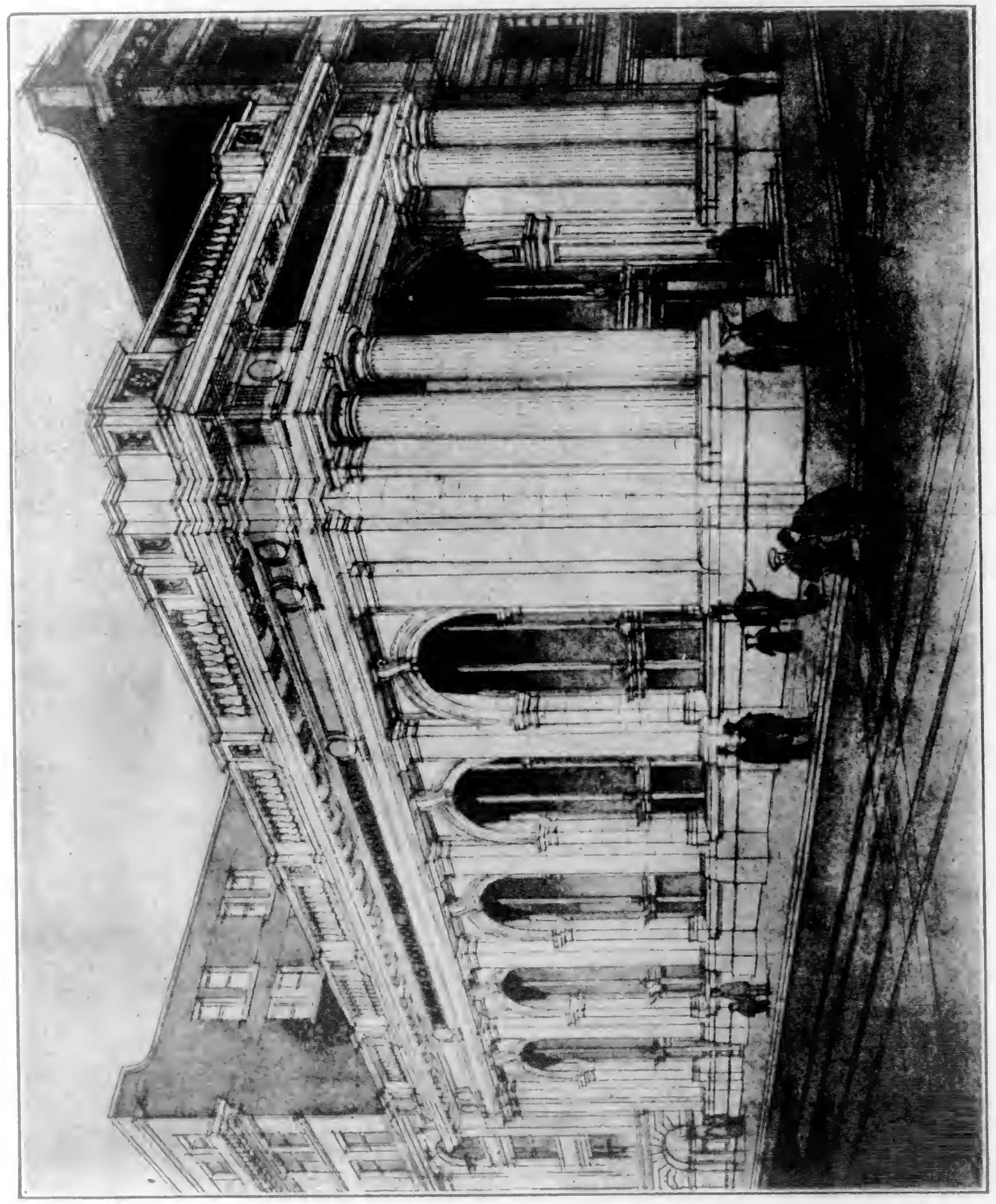
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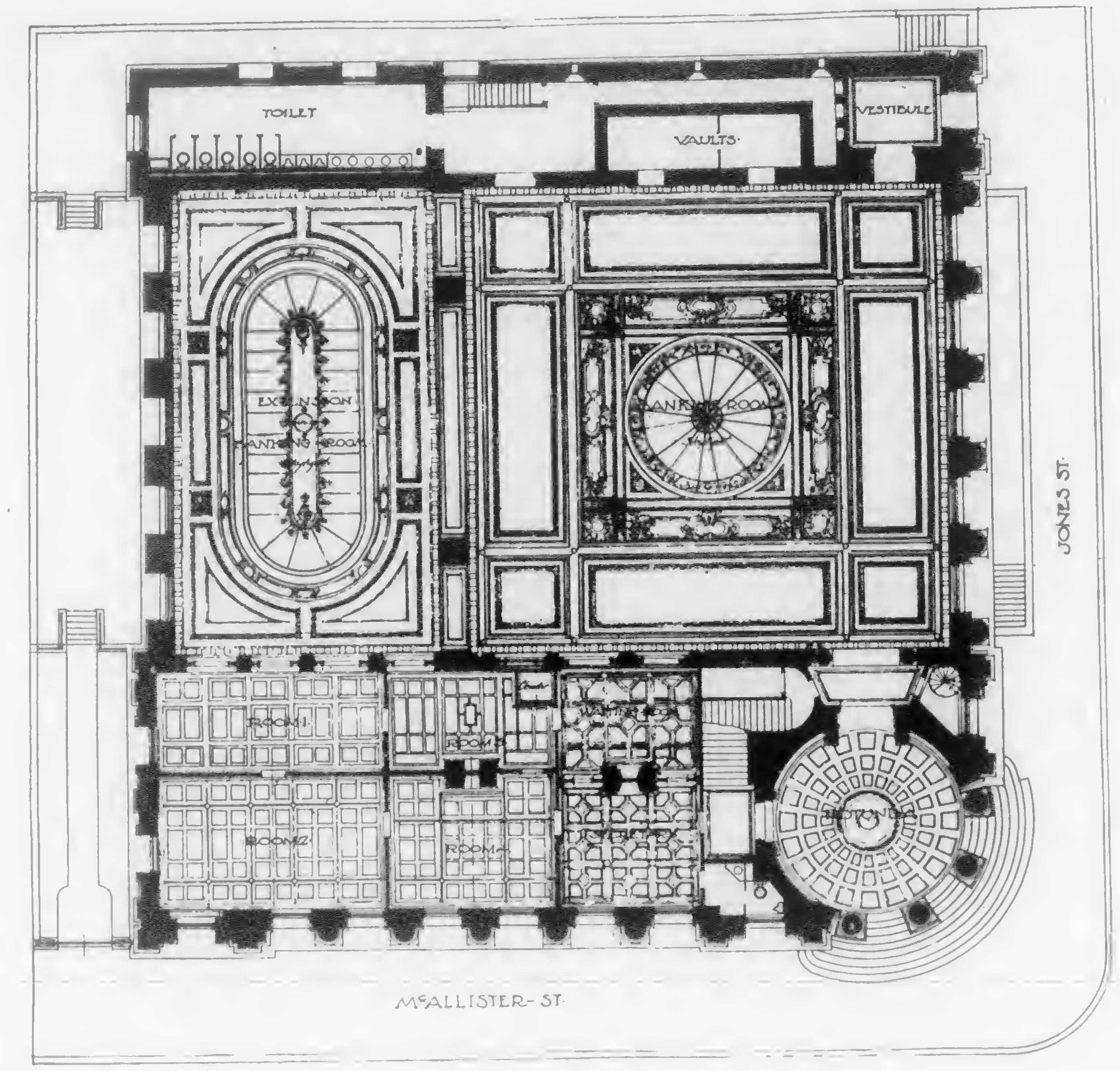


Roullier Building

London-Paris National Bank Building, San Francisco

Albert Pissis, Architect



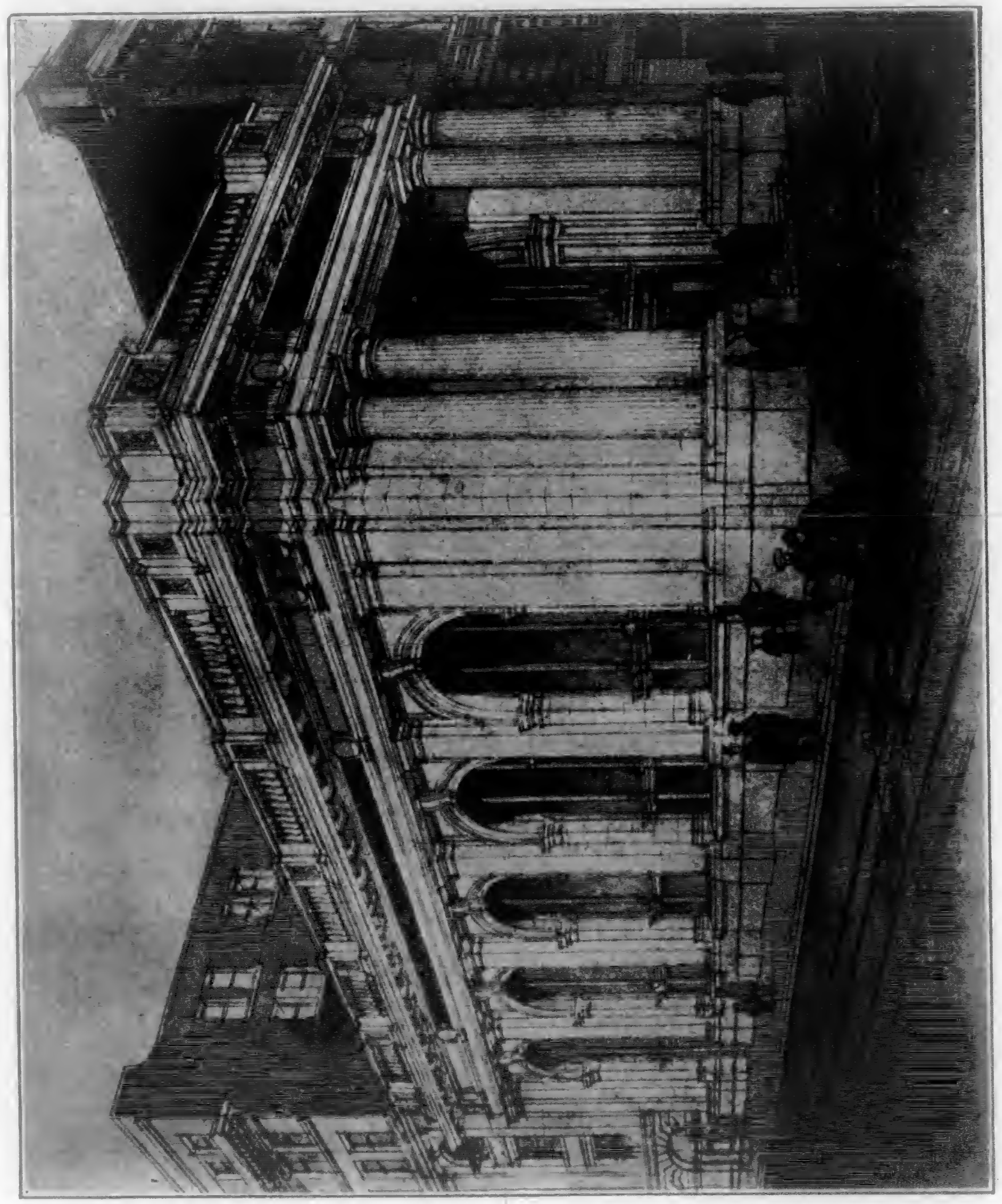


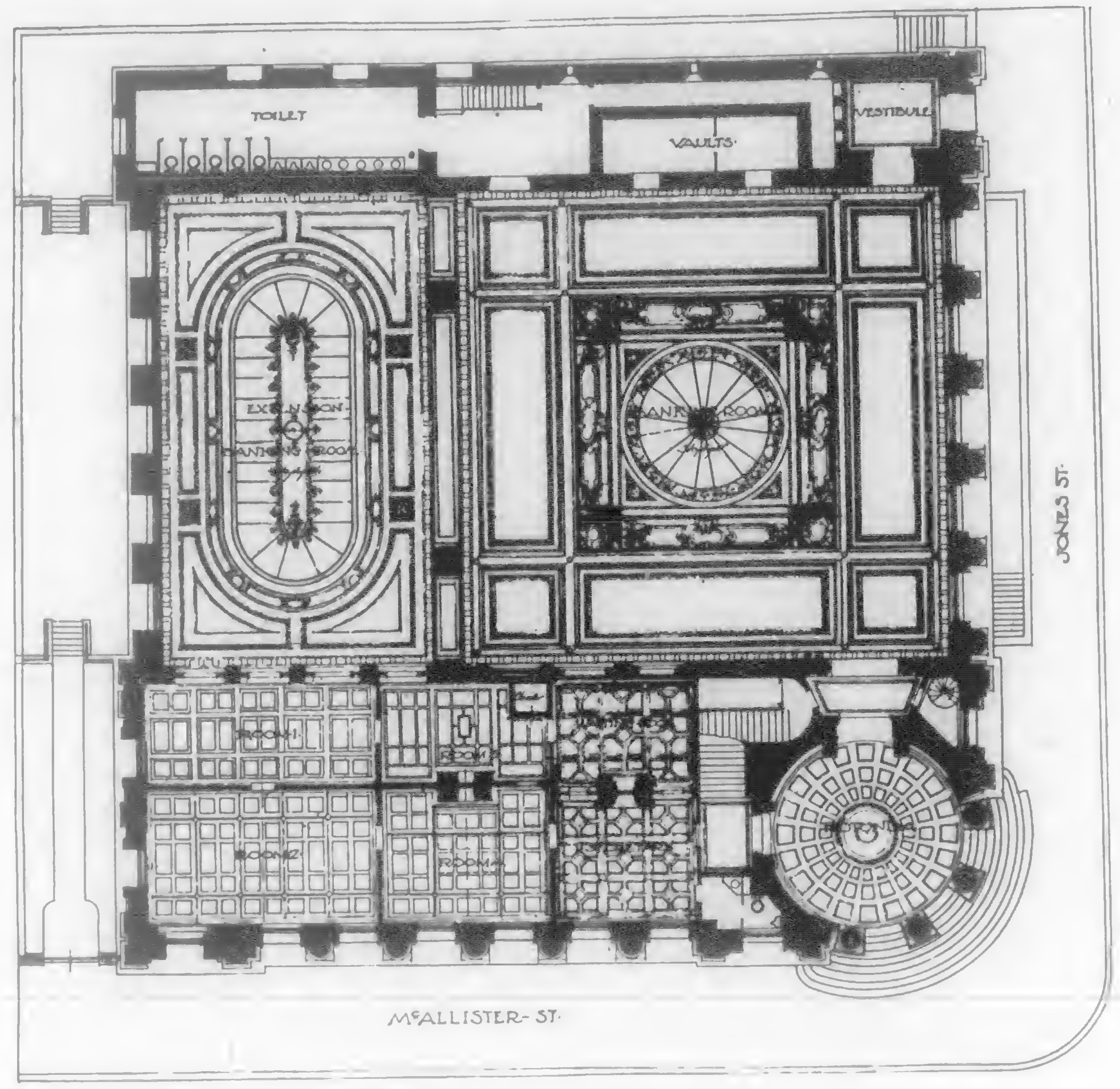
Plan of the Enlarged Hibernia Bank Building
Albert Pissis, Architect

was restored, with an additional wing. The structure became famous at once and marked an epoch in San Francisco architecture and placed its designer at one bound in the forefront of his profession, where he has remained ever since. The building from first to last shows no sign whatever of immaturity. There is no groping, no faltering, and apparently no unpardonable imperfections. Moreover, the building shows in a marked degree all the qualities so conspicuous in the work of its author—the monumental plan, the use of the noblest material throughout, the thorough knowledge of the materials used, whether granite, marble, bronze or mahogany; the nice maintenance of the scale in which the design is "pitched," to borrow a simile from a sister art, and consequently a certain quite admirable virility of detail which is always refined but never superfine. And, then, there is the "finish," that quality which makes a work of art perfect like a work of nature—a flower, a bird or any living organism where every part inside and outside has both purpose

London-Paris National Bank Building. San Francisco

Albert Pissis, Architect





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Antone Borel & Co. Bank, San Francisco
Albert Pissis, Architect



St. Rose's Academy, San Francisco
Albert Pissis, Architect



Mercantile Trust Company Building, San Francisco
Albert Pissis, Architect



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St. Rose's Academy, San Francisco
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Mercantile Trust Company Building, San Francisco
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James Flood Building, San Francisco, from Powell and Market Streets
Albert Pissis, Architect

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In addition to the Hibernia Bank, both the James Flood and the Emporium buildings have been restored since the fire. All three buildings, though damaged, were not disfigured architectually and the original lines are the same to-day as they were when first built. In conclusion, a word of praise for the Emporium and Flood buildings by a distinguished visiting architect, seems fitting:

"You San Franciscans don't half appreciate these noble structures. They are conceived on a scale that is truly heroic and they impart to Market street, where they front one another, a touch of grandeur truly imperial. Perhaps the best effect is produced on one leaving the colonnaded vestibule of the Flood building, with a view of the Emporium framed in the arched exit. Here one gets an architectural ensemble of metropolitan magnificence hardly equalled for dignity and repose in any commercial street scene in the world."



Main Corridor of the Flood Building, looking toward the Ellis-Street Entrance.



Grand Staircase to Tait's Café, Basement of James Flood Building
Albert Pissis, Architect
Marble Work by Columbia Marble Company



James Flood Building, San Francisco, from Powell and Market Streets
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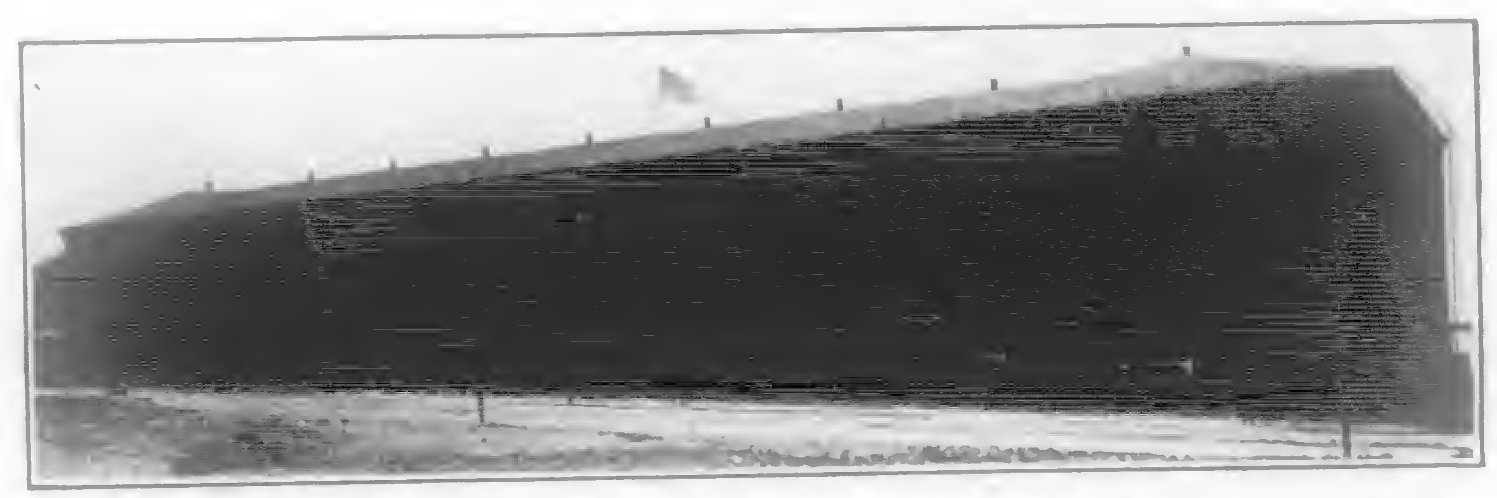
The Flood Building at Powell and Eddy Streets, San Francisco
Albert Pissis, Architect



Home of the Little Sisters of the Poor, San Francisco
Albert Pissis, Architect



Detail of Entrance to Flood Building



One of the first buildings designed by Mr. Pissis, North Point, San Francisco. Originally Cotton Mills, now used as an army supply depot by the United States Government



The Flood Building at Powell and Eddy Streets, San Francisco
Albert Pissis, Architect



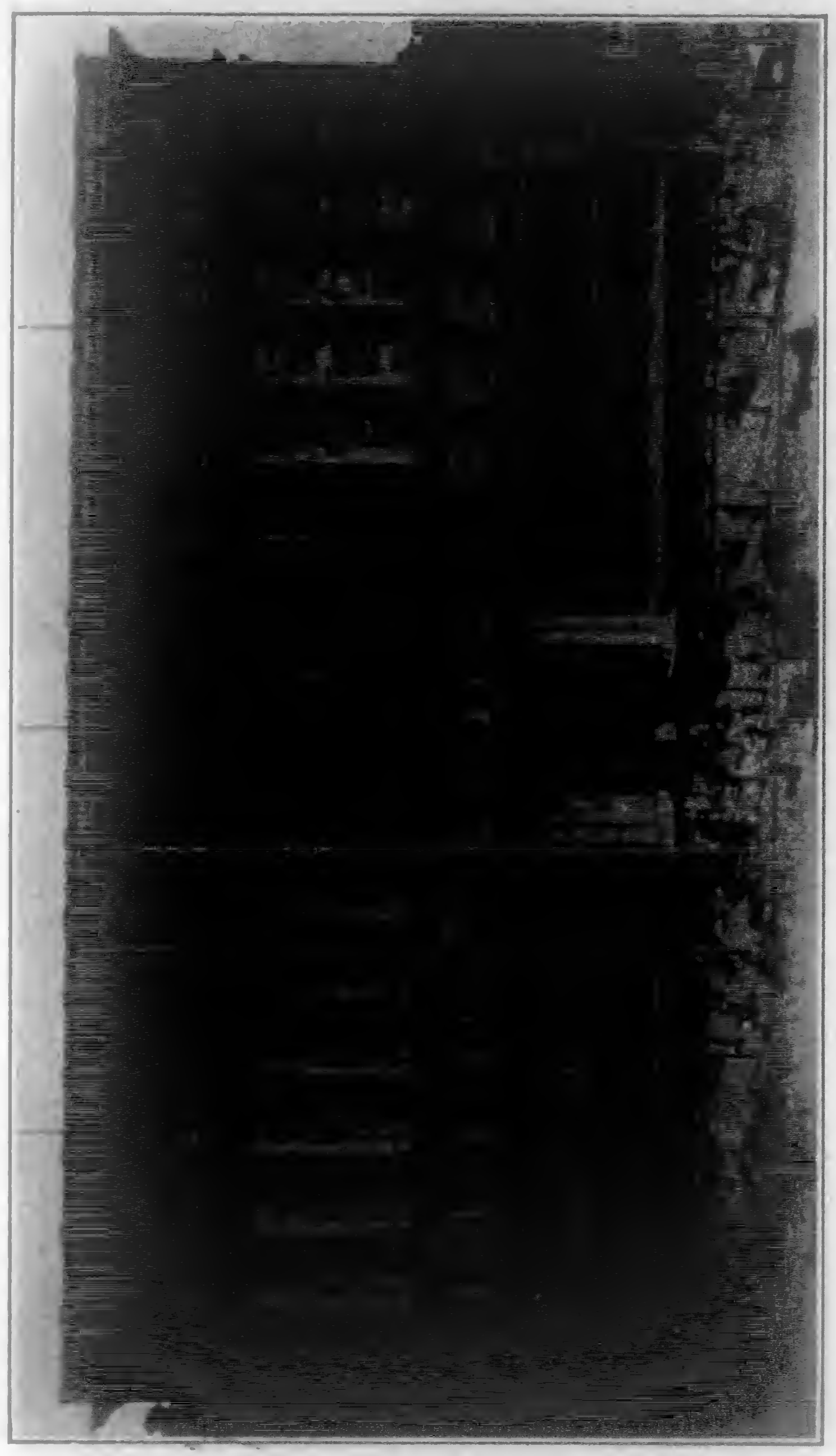
Home of the Little Sisters of the Poor, San Francisco
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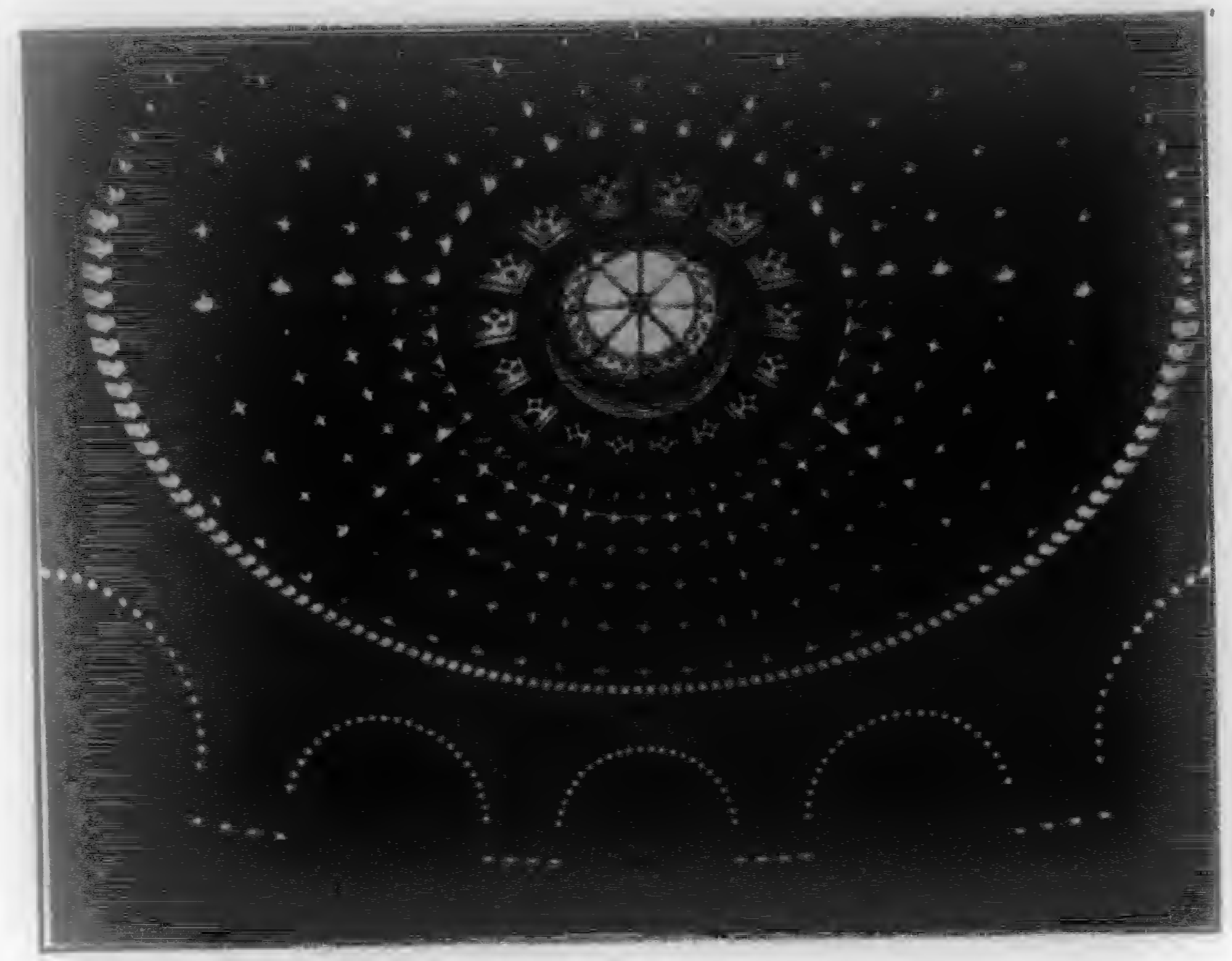
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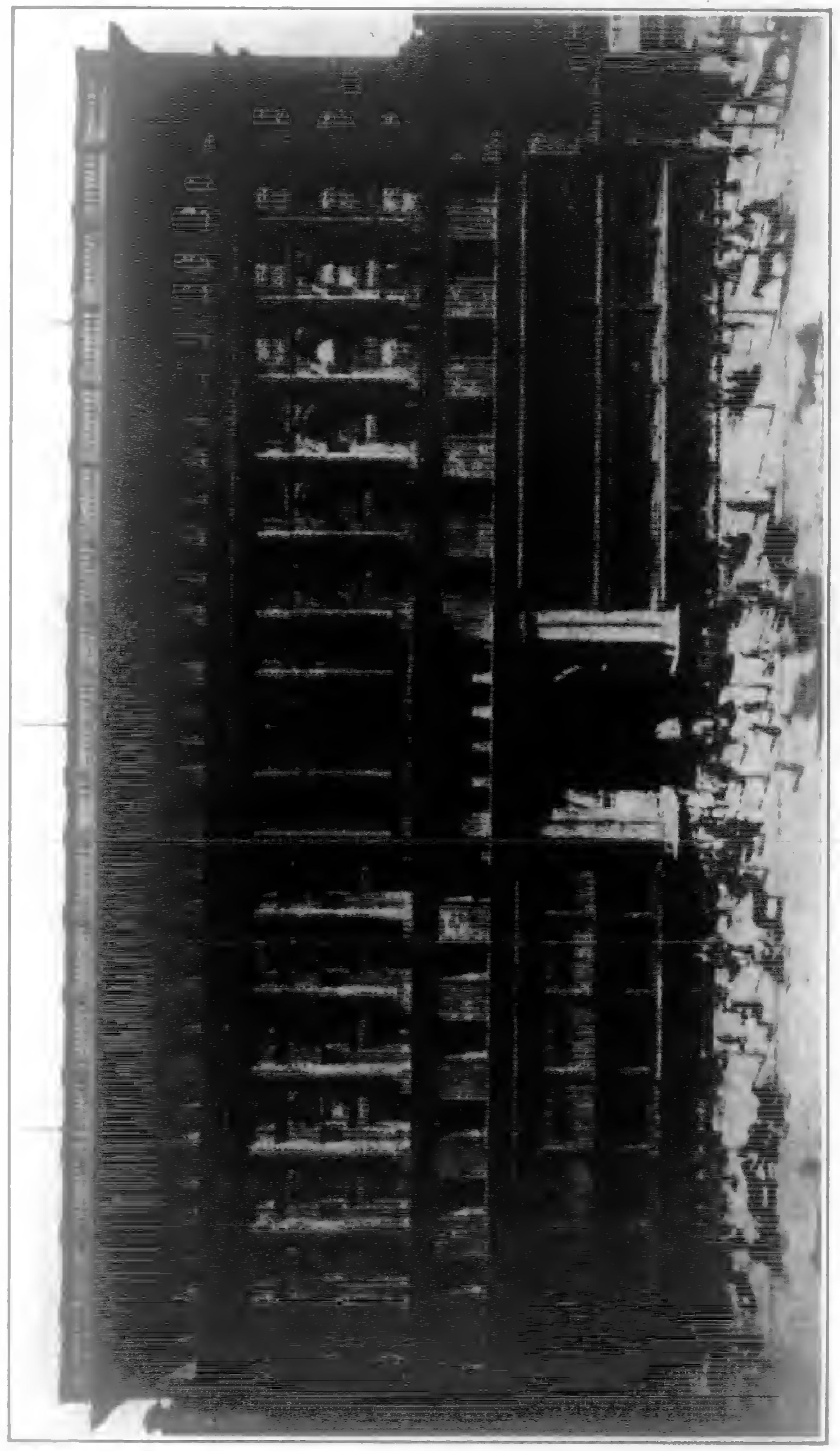
The old Parrott or Emporium Building (before the fire)
Albert Pissis, Architect



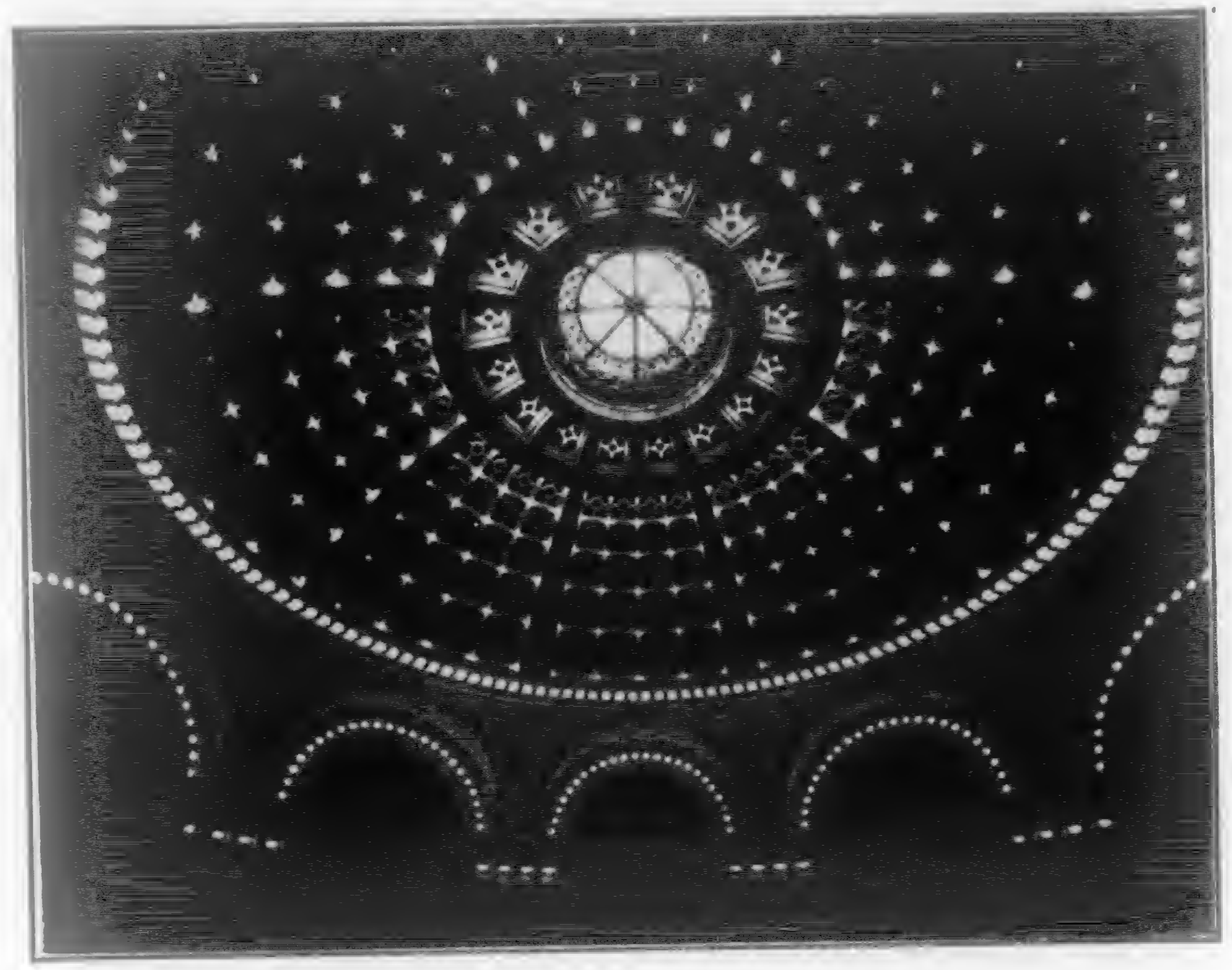
Illuminated Dome of the New Emporium Building



Completed Dome of the New Emporium Building
Albert Pissis, Architect



The old Parrott or Emporium Building (before the fire)
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Illuminated Dome af the New Emporium Building



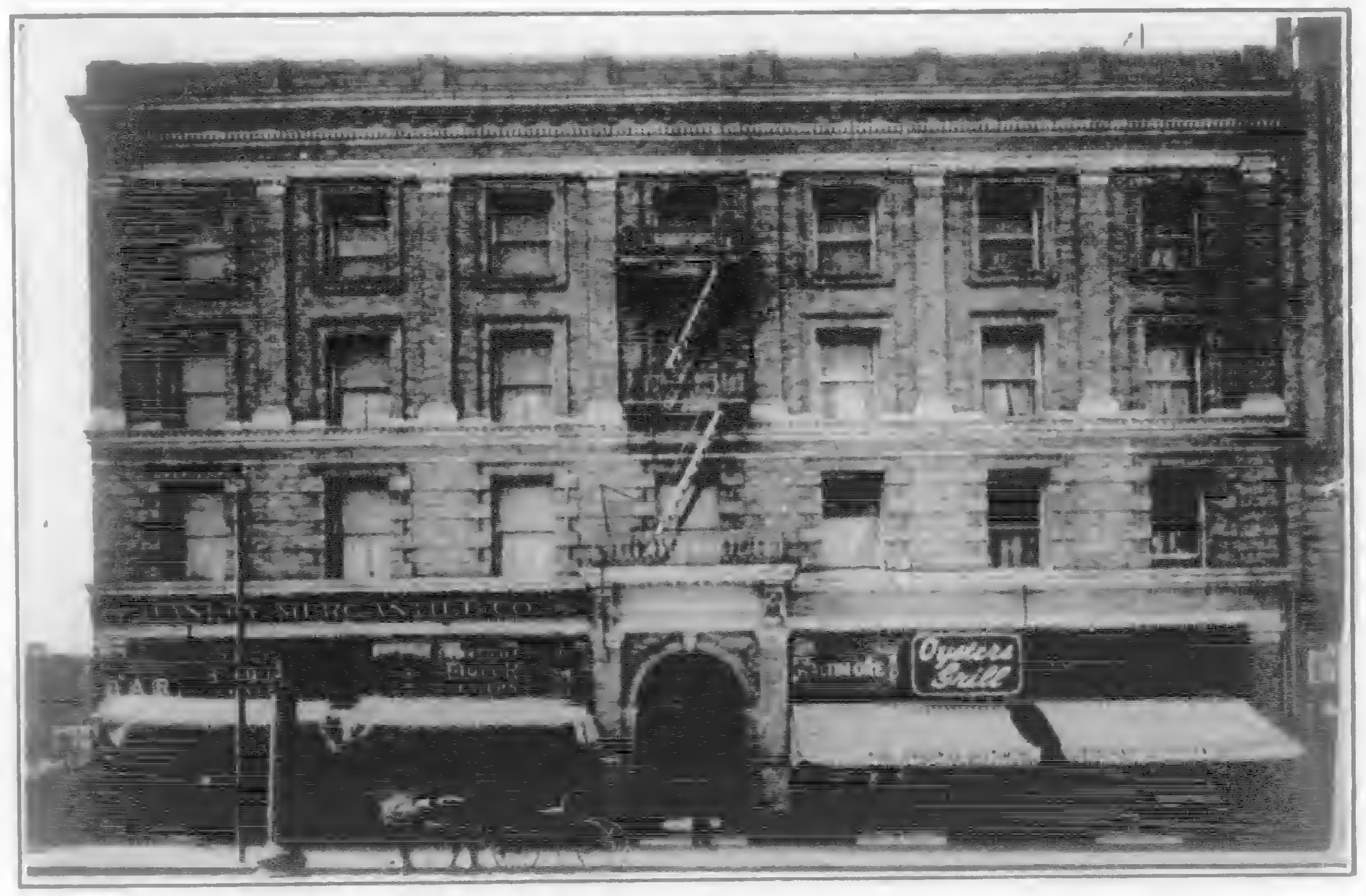
Completed Dome of the New Emporium Building
Albert Pissis, Architect



Rosenstock Building, San Francisco
Albert Pissis, Architect



Roos Bros.' Building, San Francisco
Albert Pissis, Architect



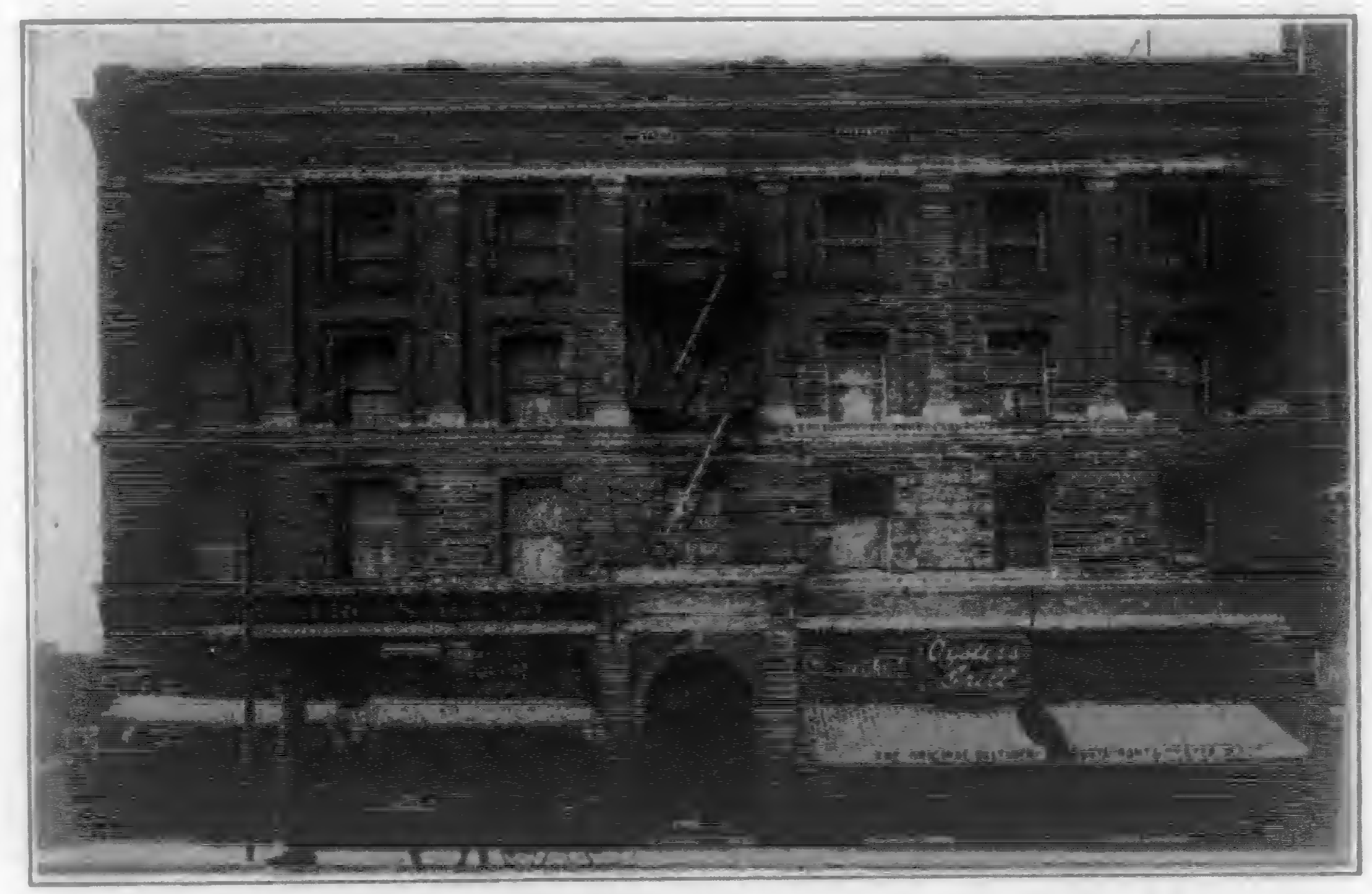
Sutro Building, San Francisco
Albert Pissis, Architect



Rosenstock Building, San Francisco
Albert Pissis, Architect



Roos Bros.' Building, San Francisco
Albert Pissis, Architect



Sutro Building, San Francisco
Albert Pissis, Architect



Rochat-Cordes Building, San Francisco
Albert Pissis, Architect



The White House, San Francisco
Albert Pissis, Architect *Lewis A. Hicks Company, Builders*



Heyman-Weil Building, San Francisco
Albert Pissis, Architect



Rochat-Cordes Building, San Francisco
Albert Pissis, Architect



The White House, San Francisco
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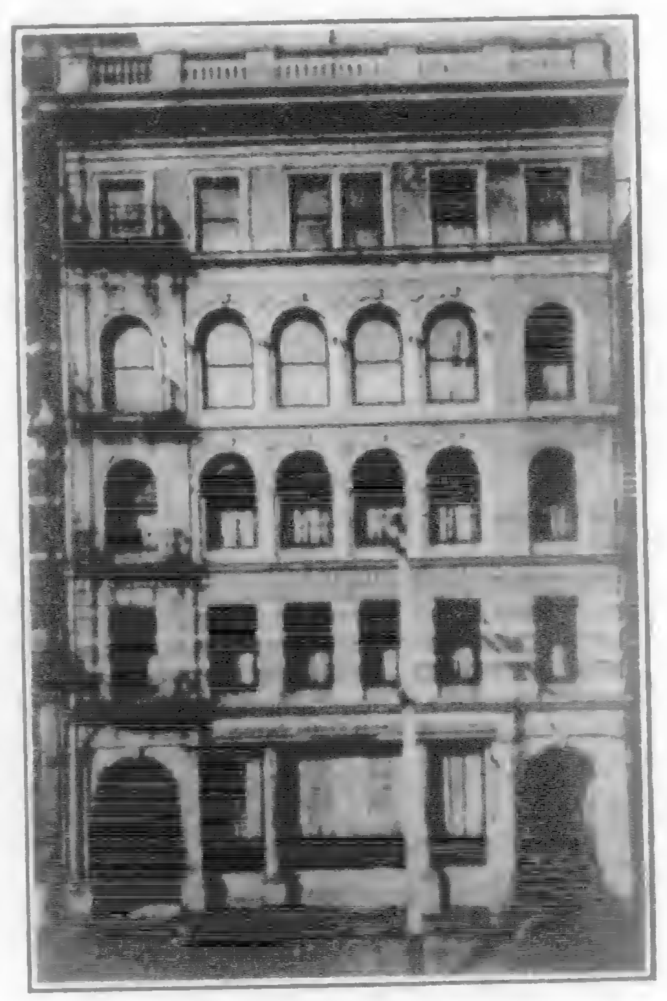
Heyman-Weil Building, San Francisco
Albert Pissis, Architect



W. P. Fuller Building, San Francisco
Albert Pissis, Architect



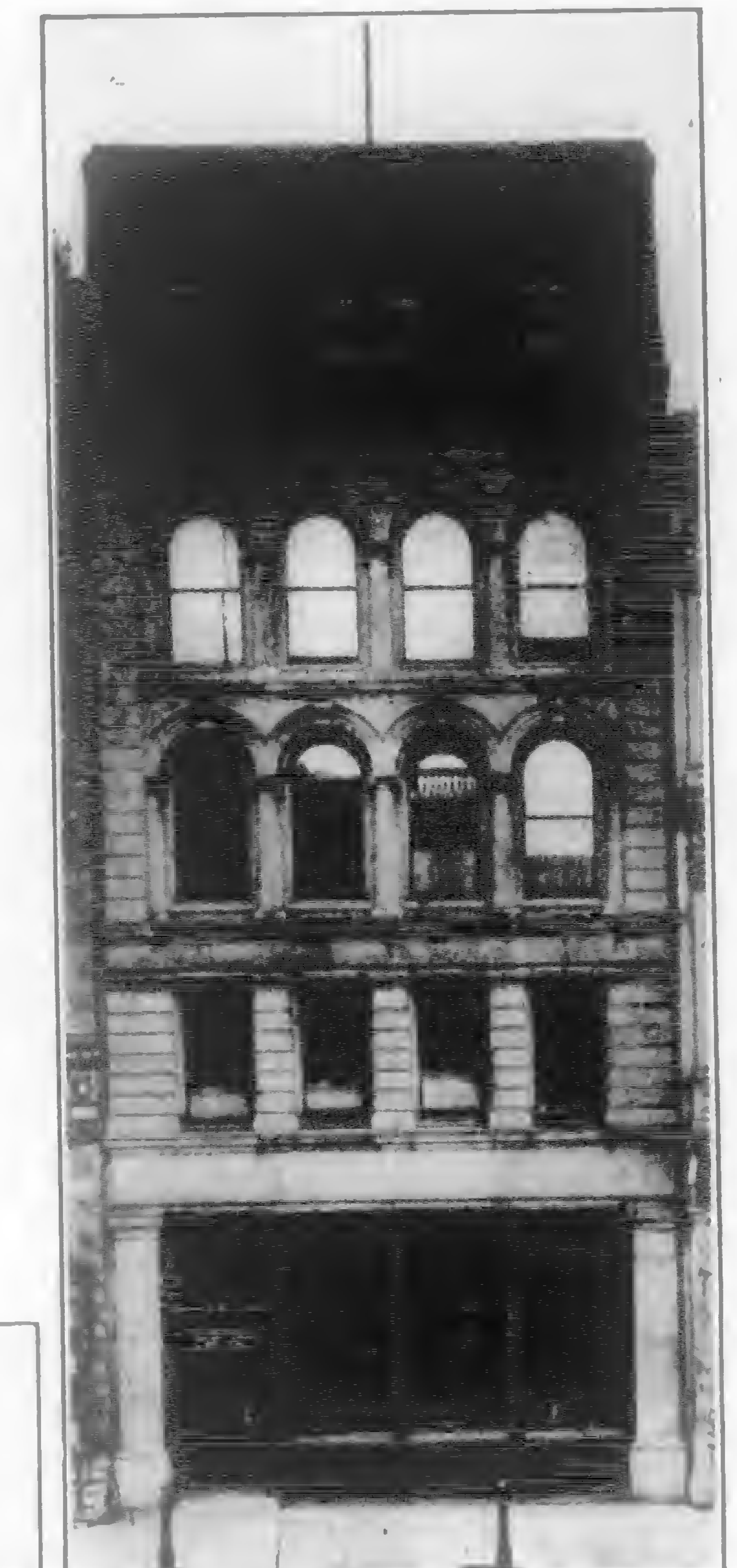
Marchand's Restaurant
Albert Pissis, Architect



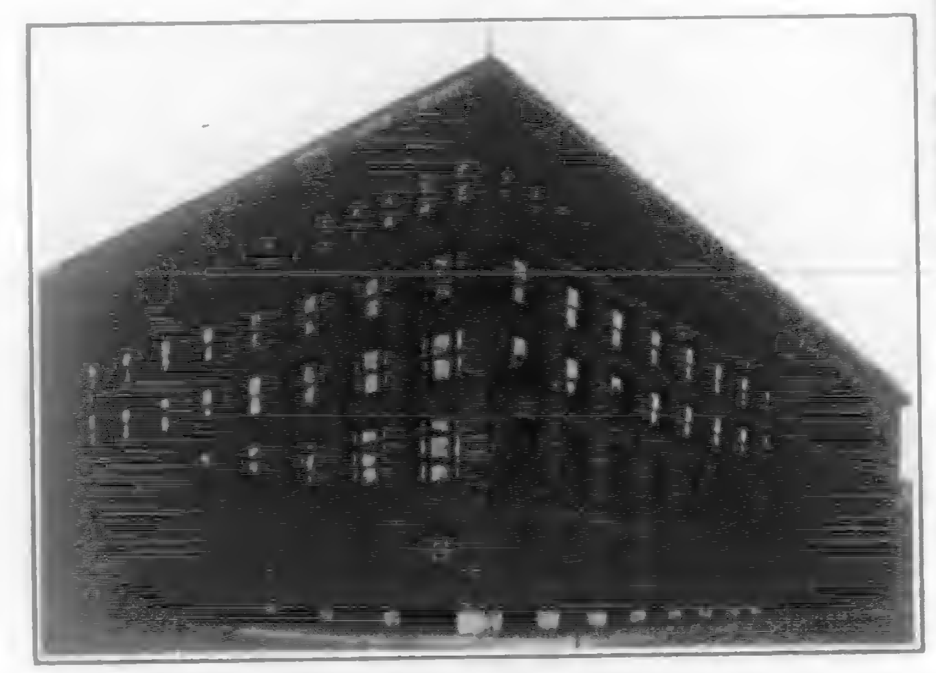
Delmonico's Restaurant
Albert Pissis, Architect



The Callaghan Building (before the fire)
Albert Pissis, Architect

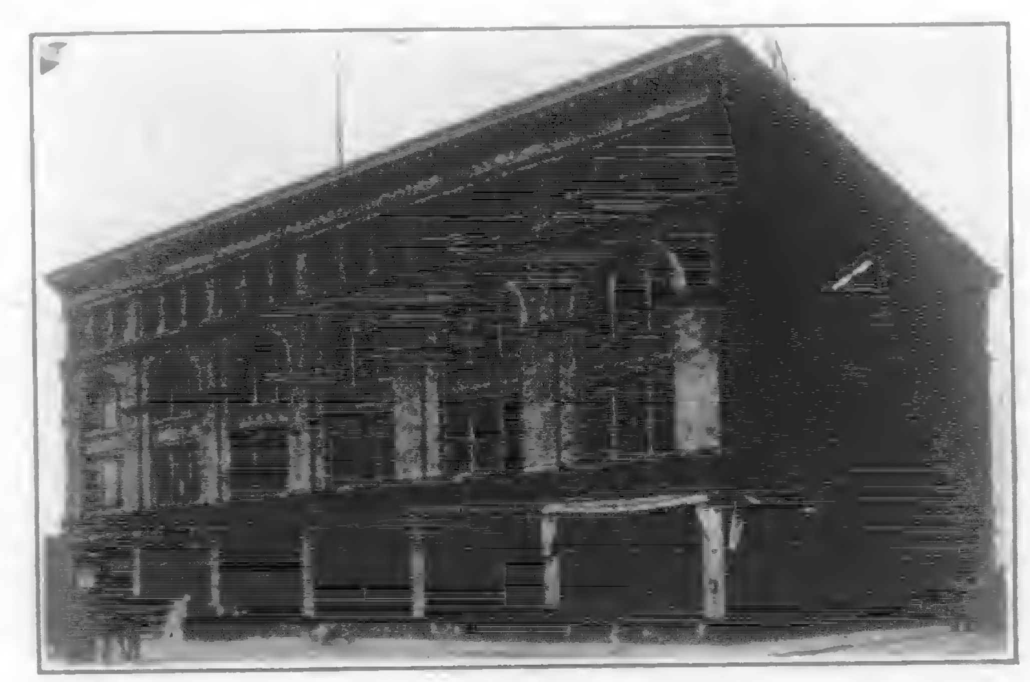


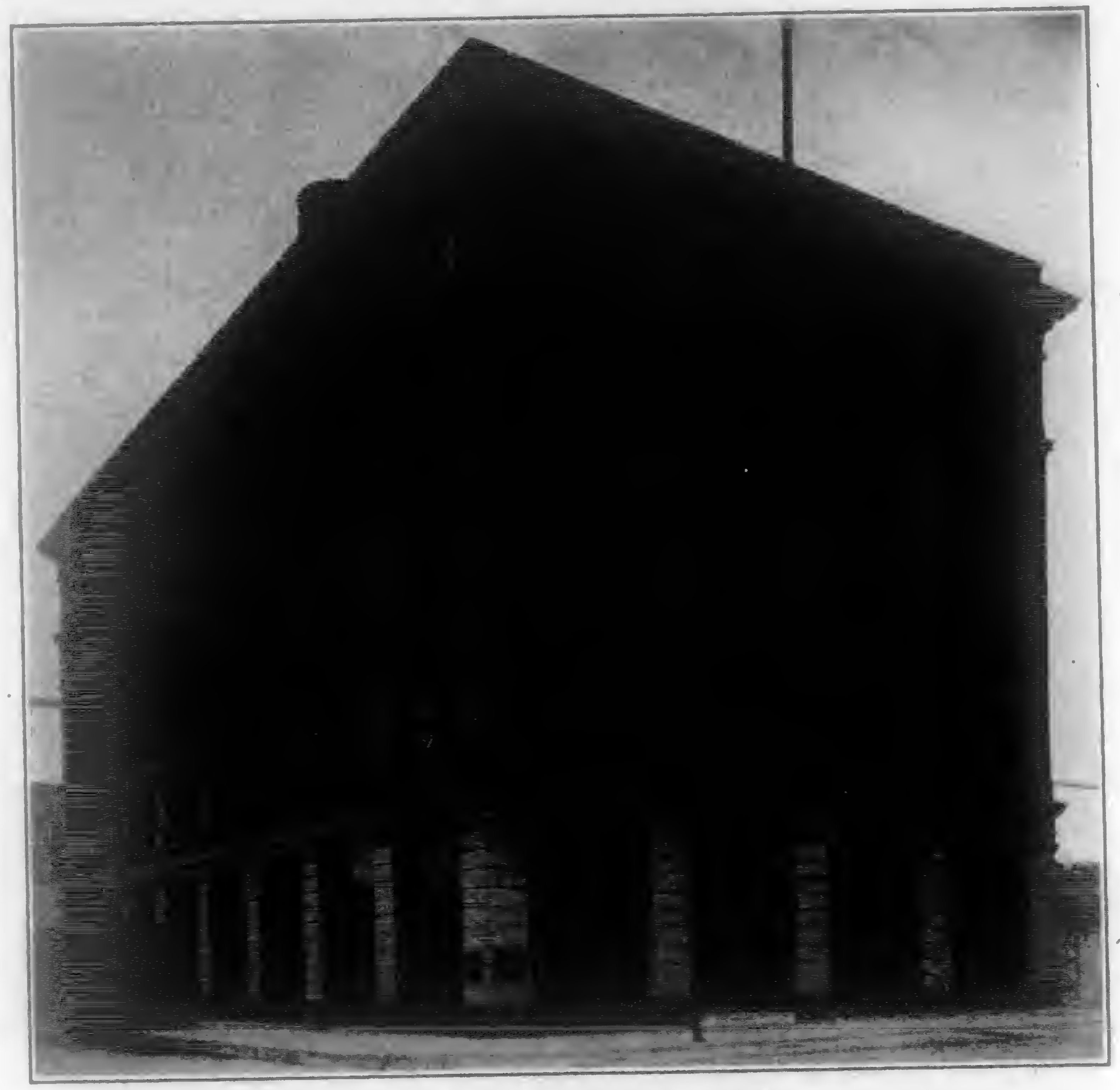
Alliance Building (before the fire)
Albert Pissis, Architect



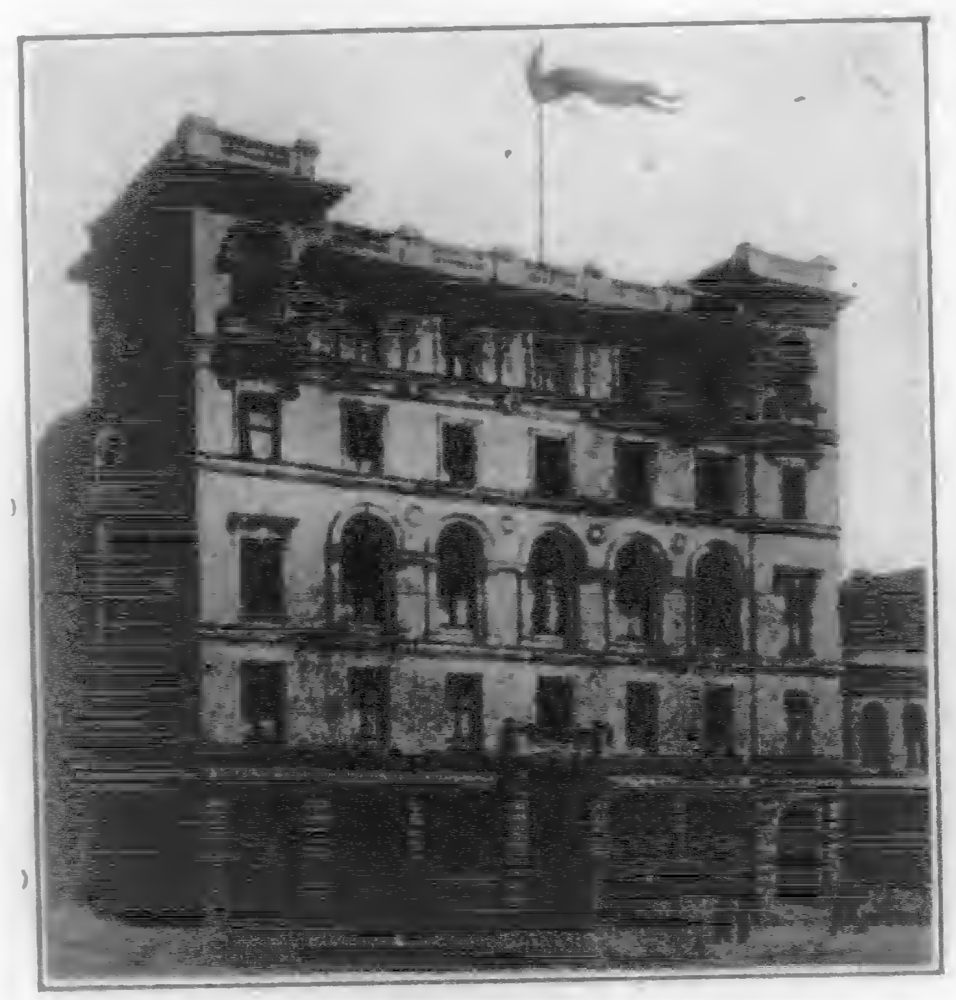
Loft Building
Albert Pissis, Architect

Haas Bros. Building, San Francisco
Albert Pissis, Architect

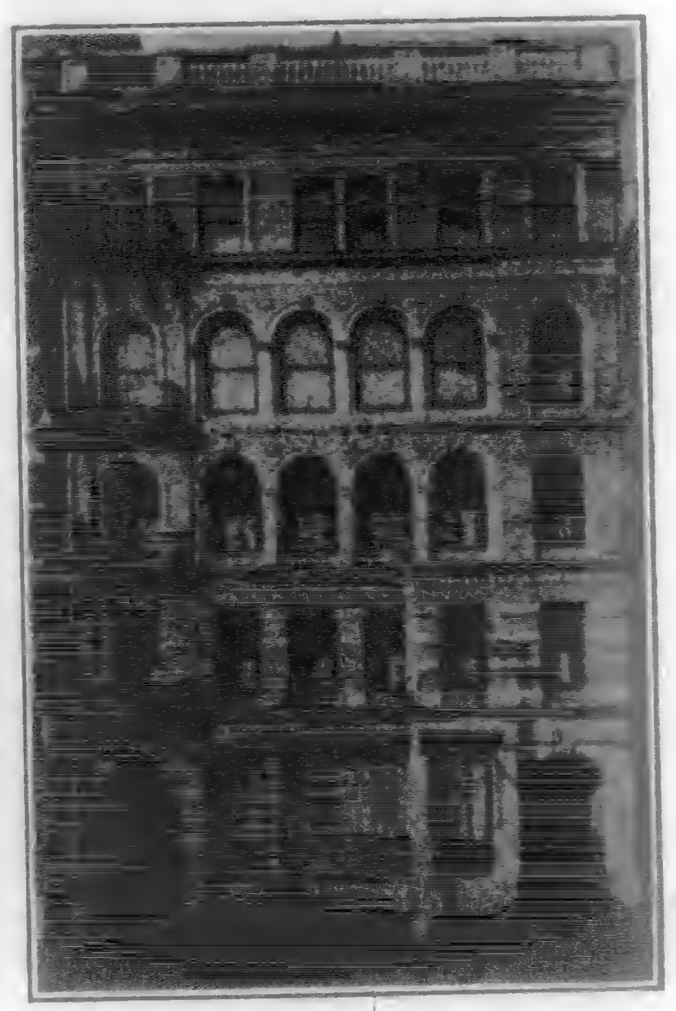




W. P. Fuller Building, San Francisco
Albert Pissis, Architect



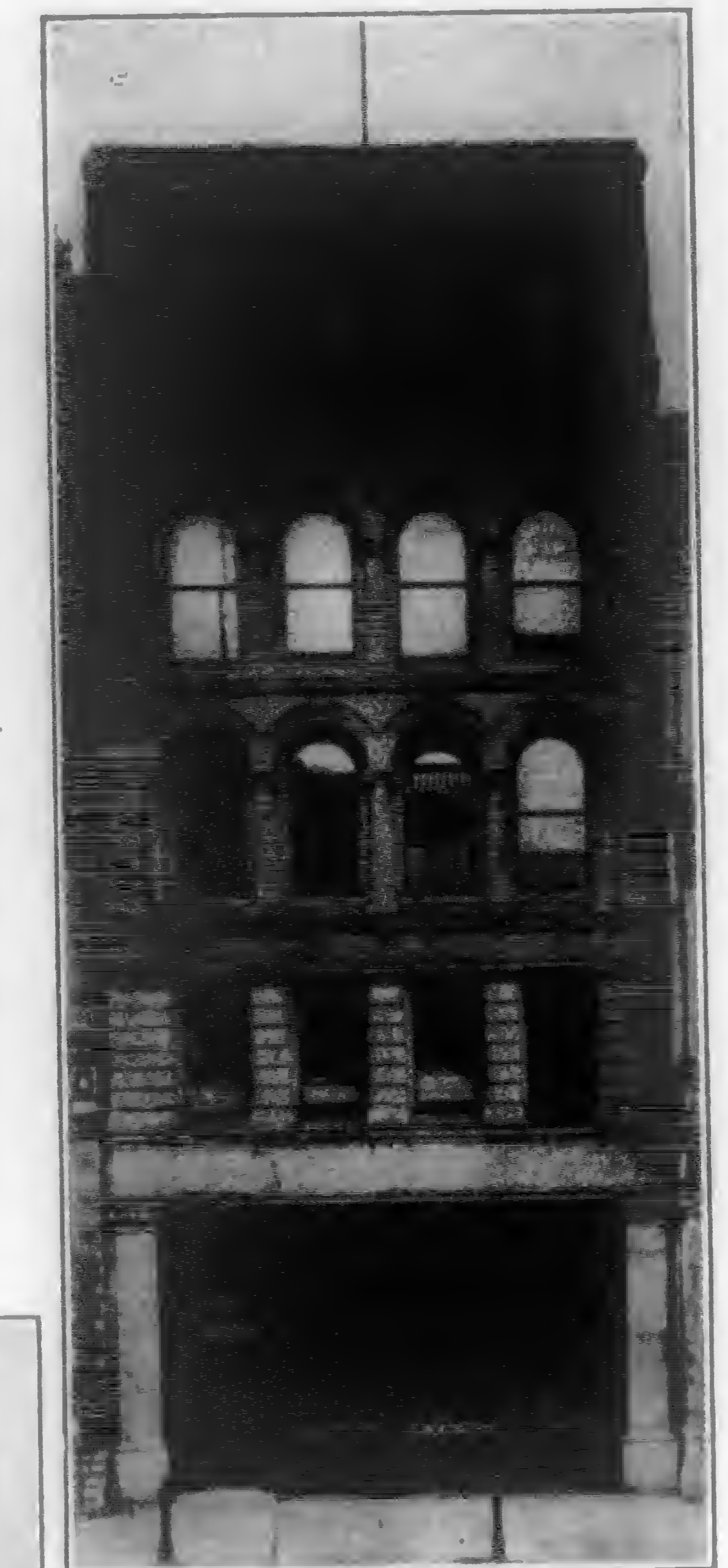
Marchand's Restaurant
Albert Pissis, Architect



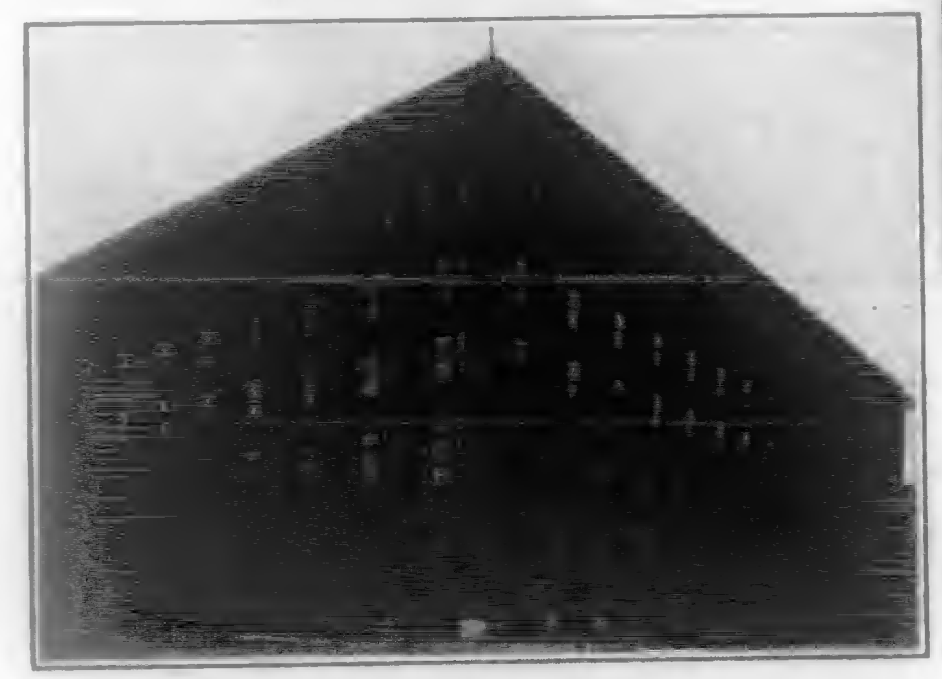
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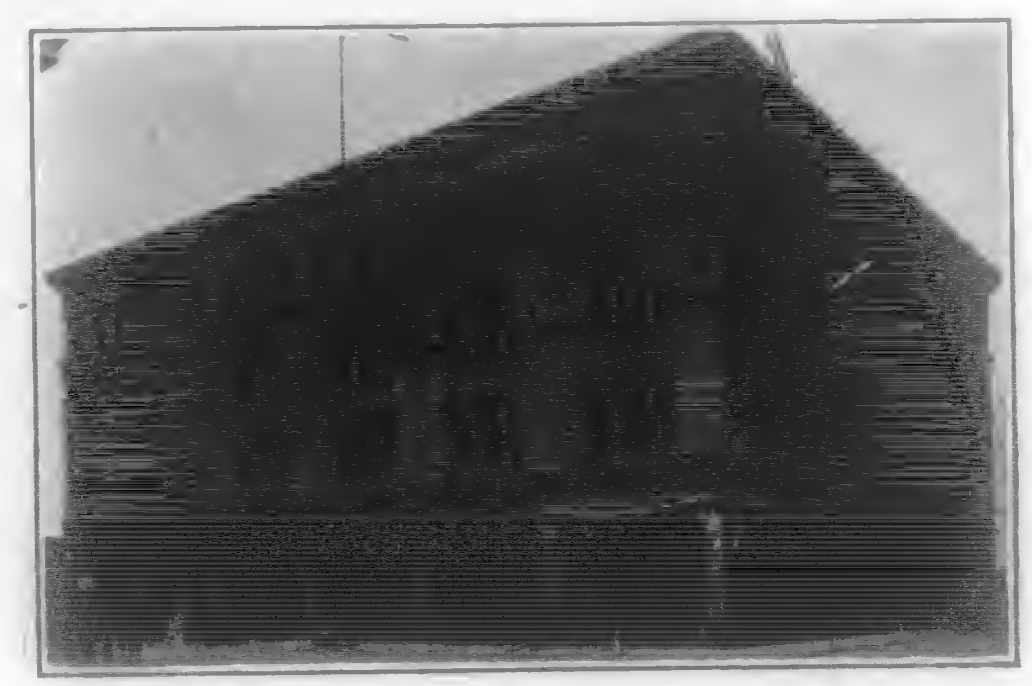


Alliance Building (before the fire)
Albert Pissis, Architect



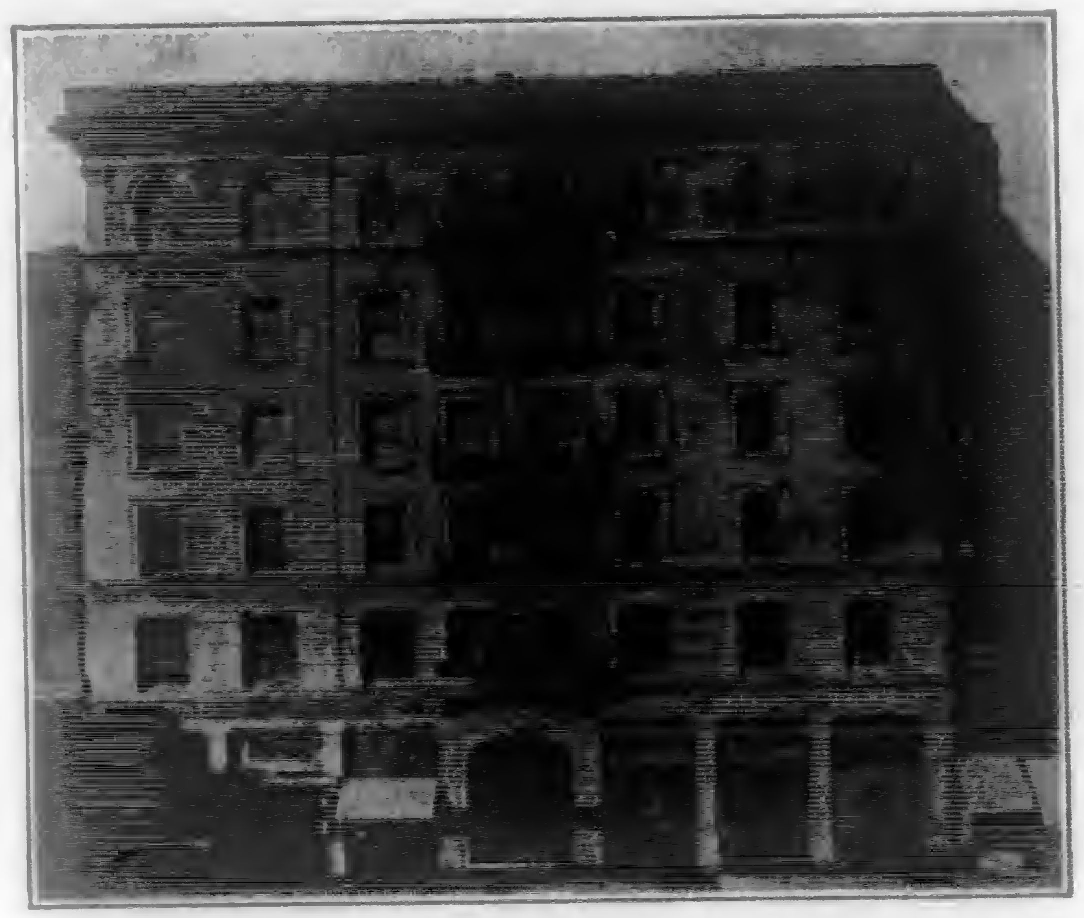
Loft Building
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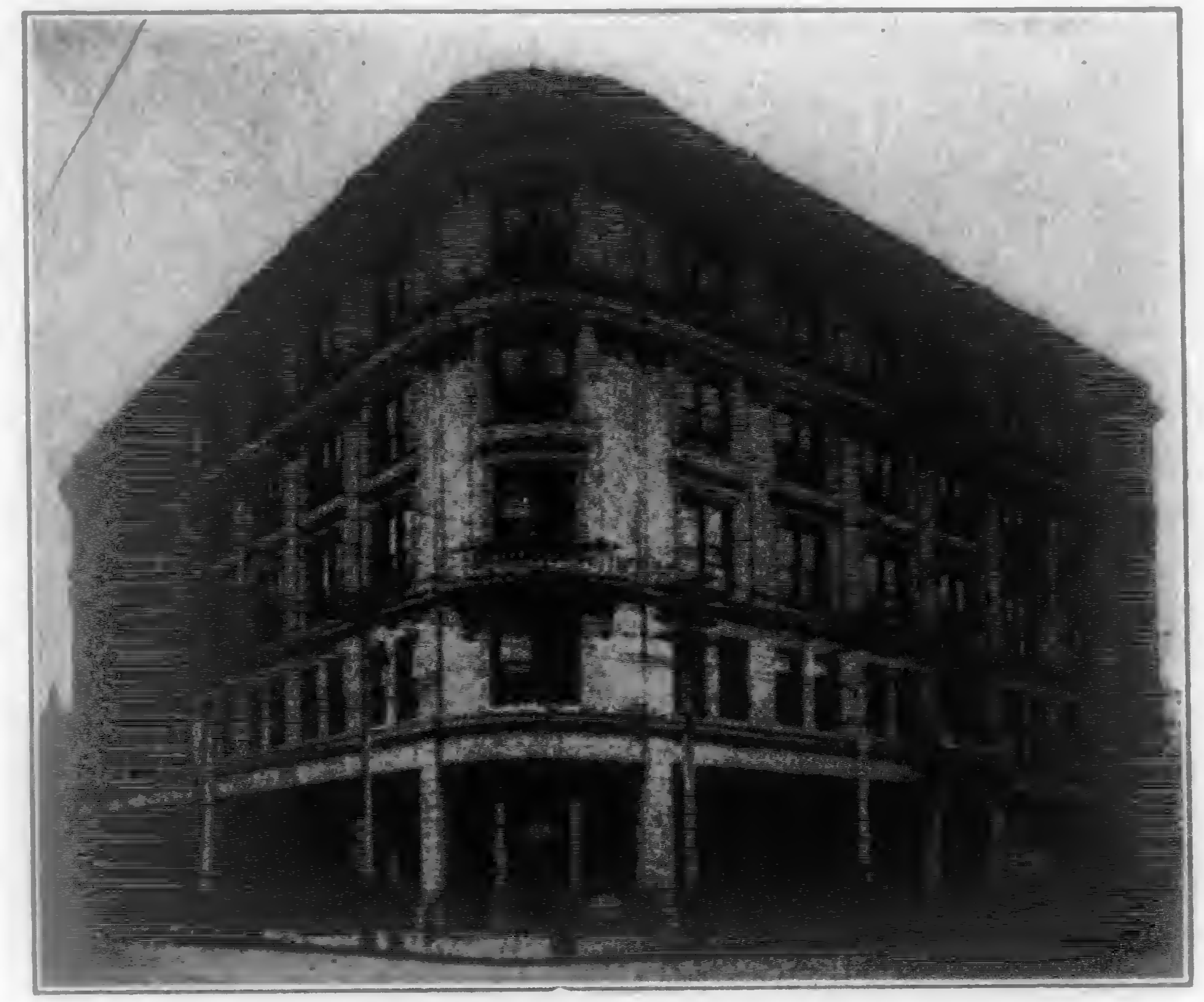
The "Howard" Apartments
Albert Pissis, Architect



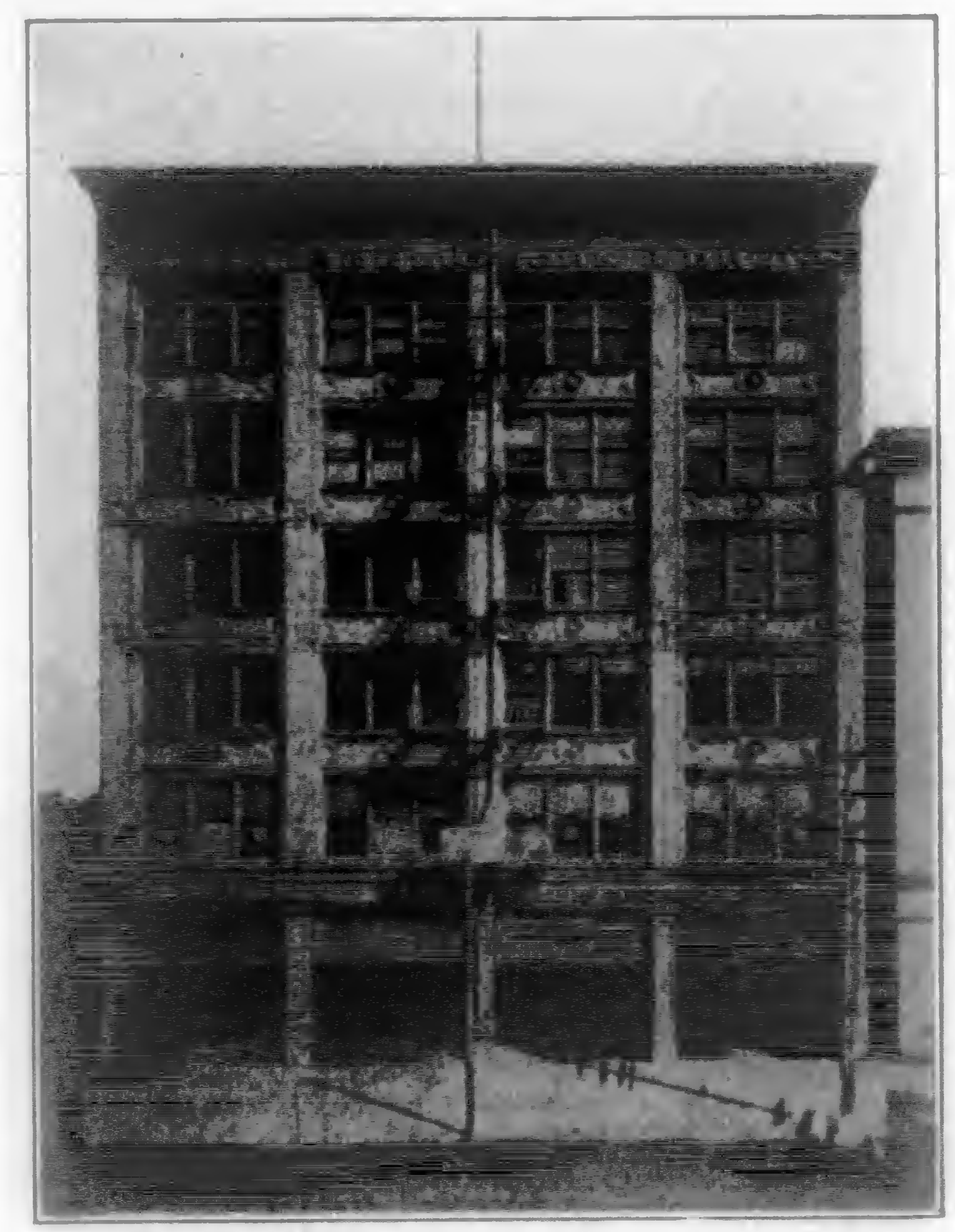
Hotel Terminus (built before the fire), Lower Market Street, San Francisco, Albert Pissis, Architect



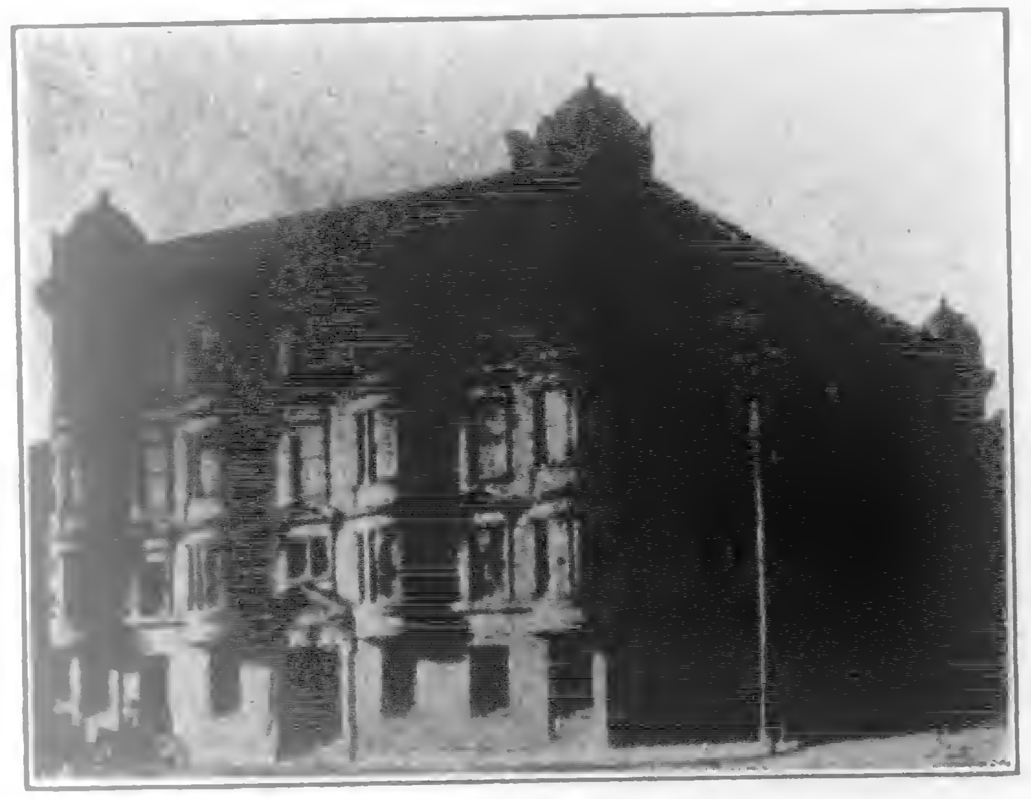
Savoy Hotel
Albert Pissis, Architect



The Wilcox Building, Los Angeles
Albert Pissis, Architect



The Wilcox Building, San Francisco
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The "Howard" Apartments
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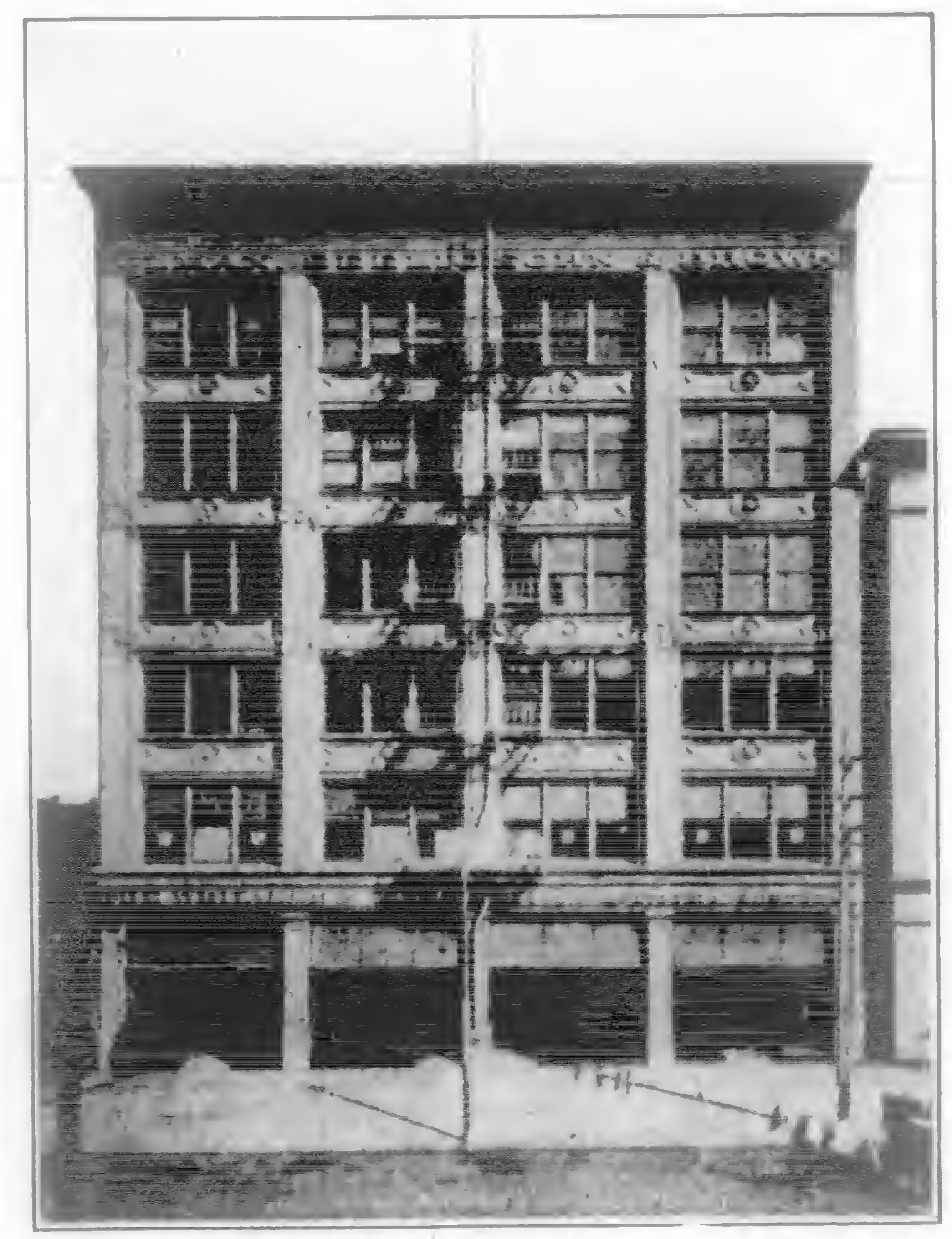
Hotel Terminus (built before the fire), Lower Market Street, San Francisco, Albert Pissis, Architect

Savoy Hotel
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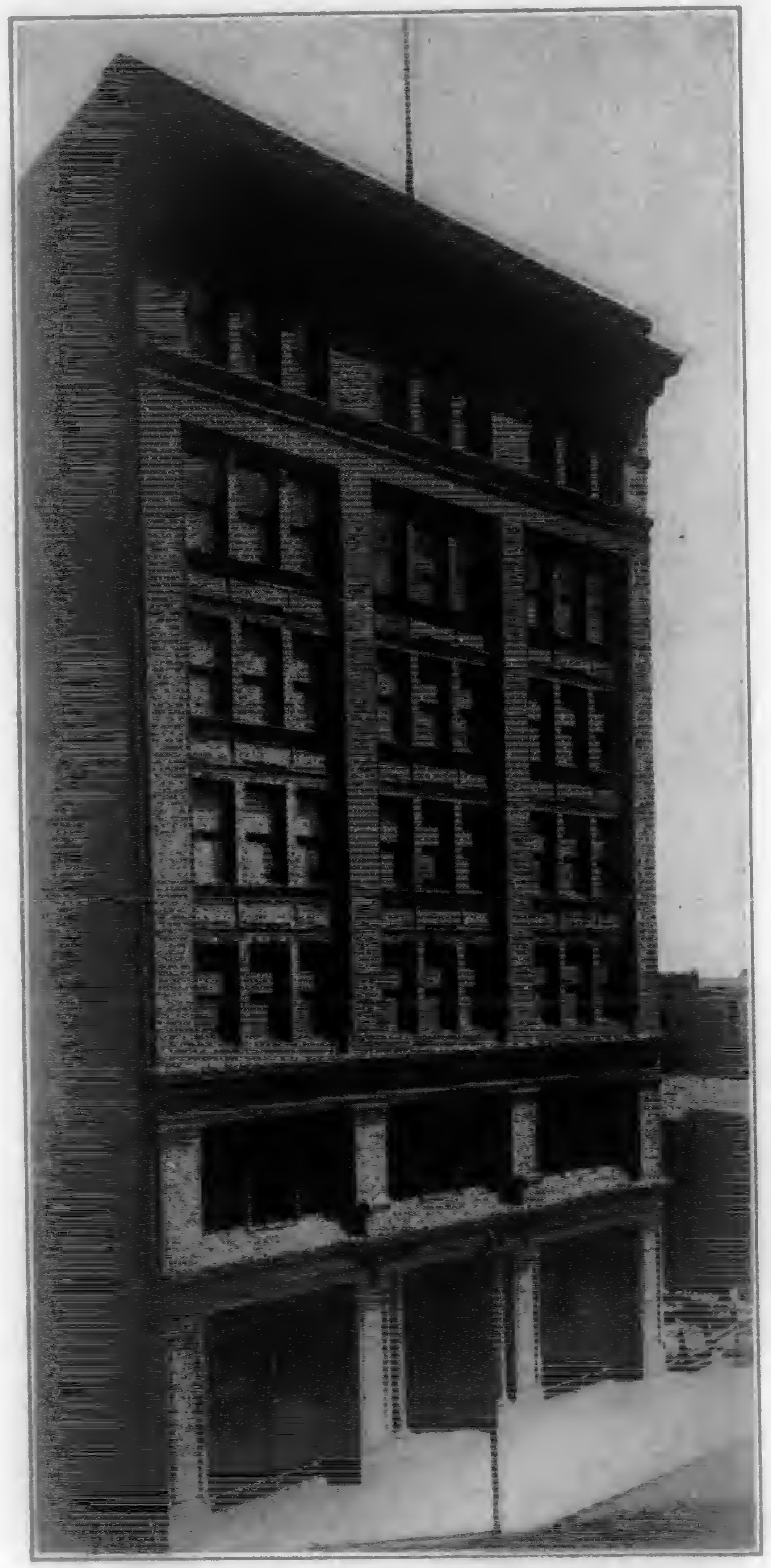
The Wilcox Building, San Francisco
Albert Pissis, Architect



California Casket Company's Building, San Francisco
Albert Pissis, Architect
Equipped with Van Emon Elevators



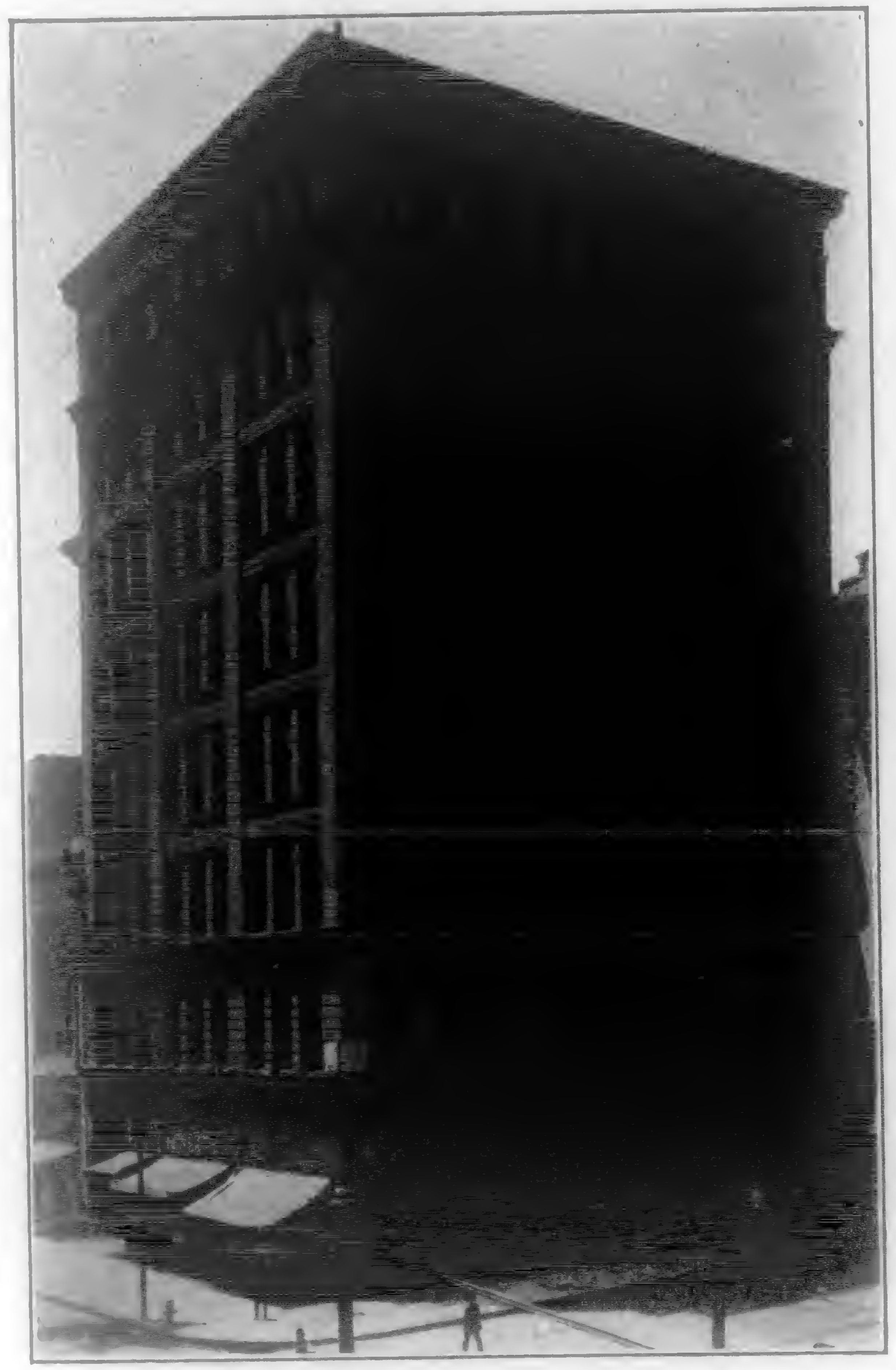
The Misses Butler Building, San Francisco
Albert Pissis, Architect



California Casket Company's Building, San Francisco
Albert Pissis, Architect
Equipped with Van Emon Elevators



The Misses Butler Building, San Francisco
Albert Pissis, Architect



Chas. H. Schmidt Building, San Francisco
Albert Pissis, Architect



Building for the Mechanics' Institute, San Francisco
Albert Pissis, Architect Lewis A. Hicks Company, Builders



Chas. H. Schmidt Building, San Francisco
Albert Pissis, Architect



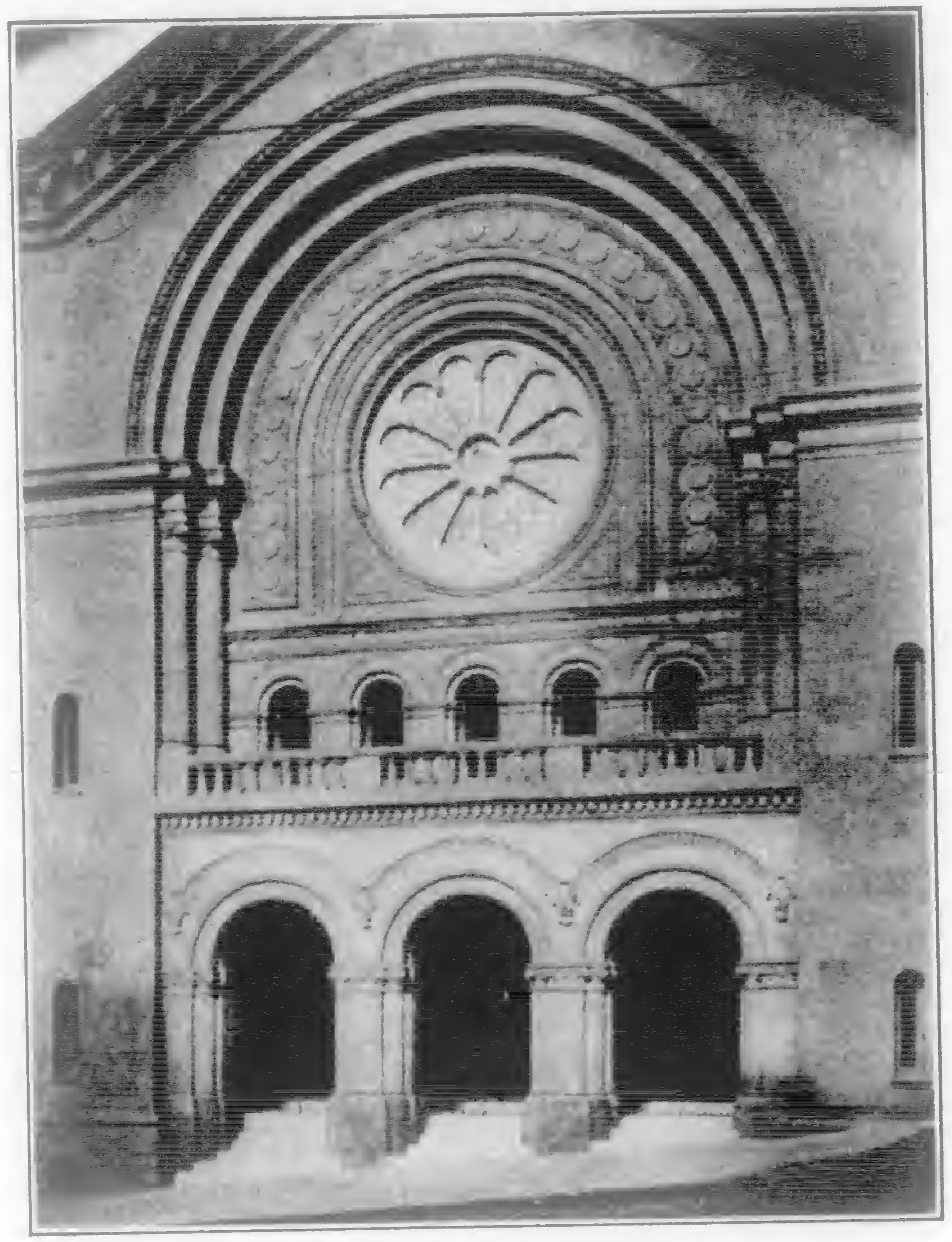
Building for the Mechanics' Institute, San Francisco
Albert Pissis, Architect *Lewis A. Hicks Company, Builders*



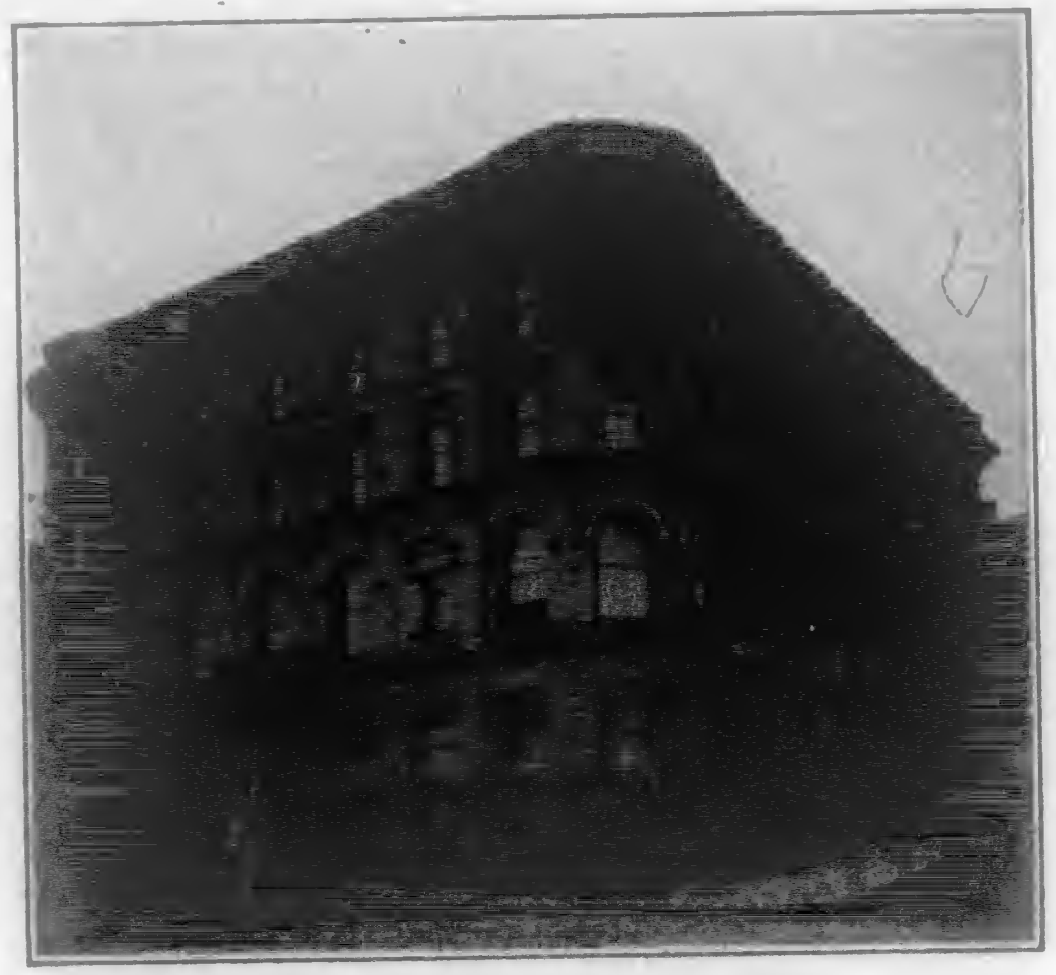
The Wenban Building,
Designed originally to house the
Bohemian Club before the fire
Albert Pissis, Architect



Jewish Synagogue, San Francisco
Albert Pissis, Architect



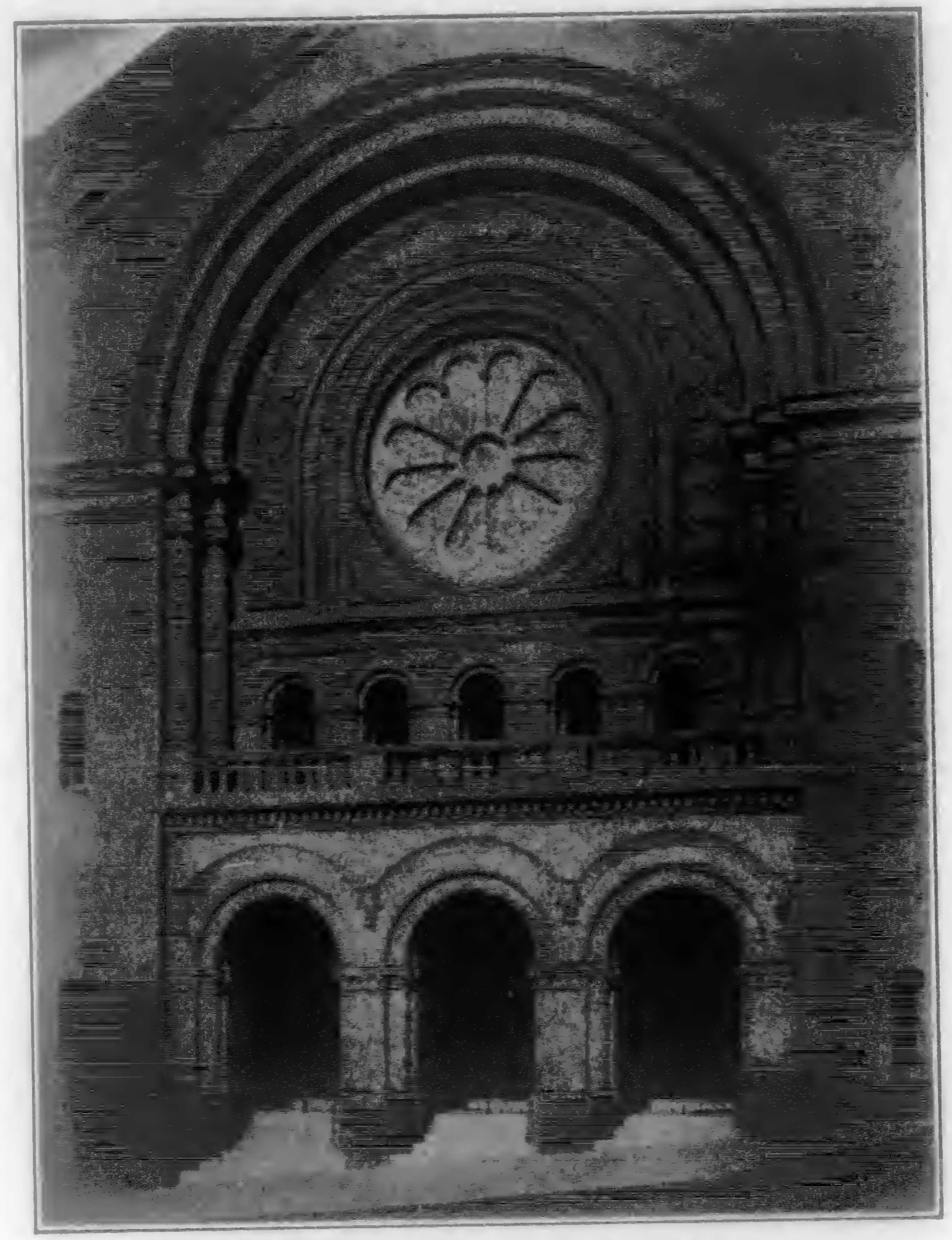
Detail of Jewish Synagogue, San Francisco
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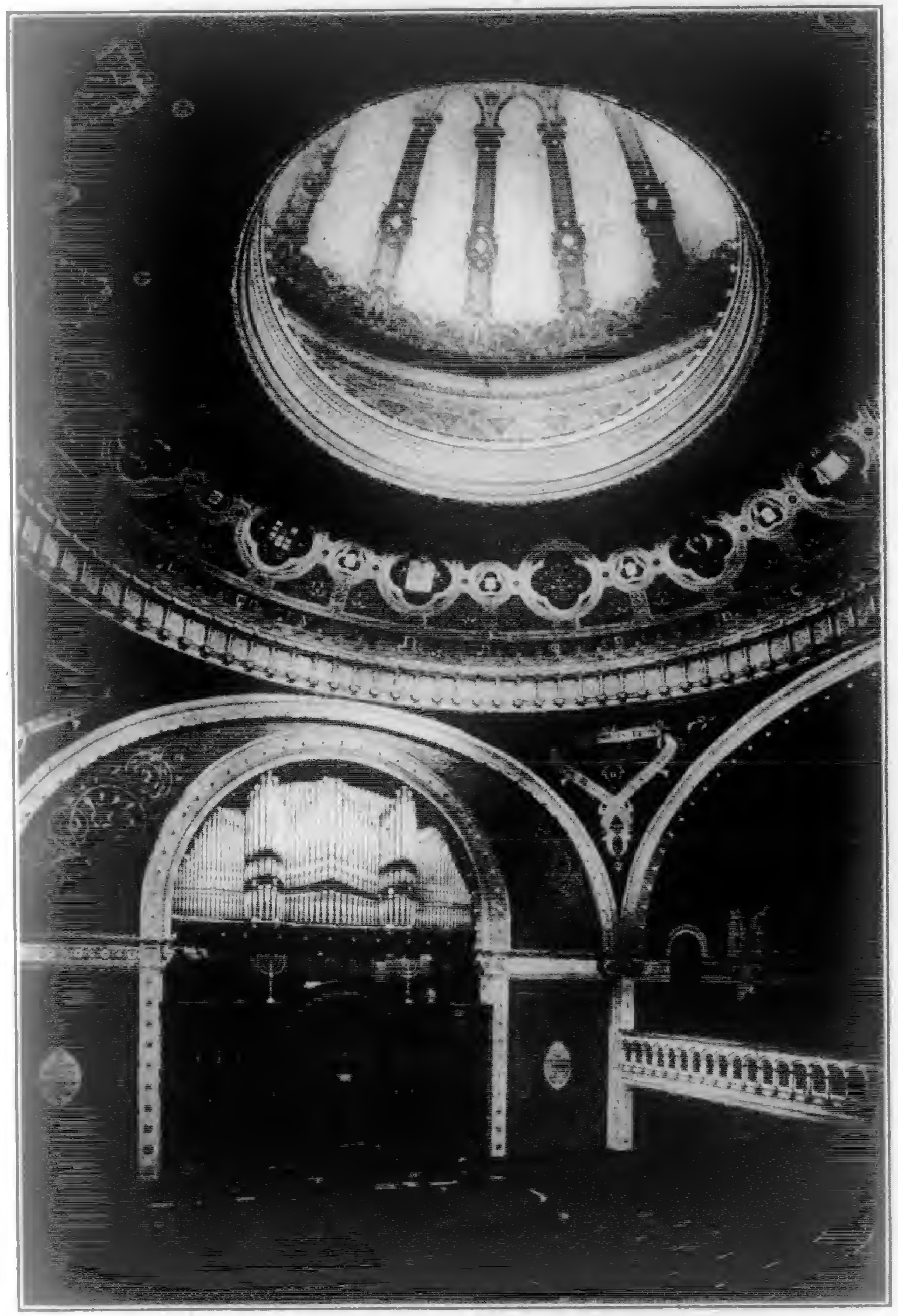
Interior Jewish Synagogue, San Francisco
Albert Pissis, Architect



Catholic Church, San Mateo
Albert Pissis, Architect



Chapel of St. Rose's Academy, San Francisco
Albert Pissis, Architect



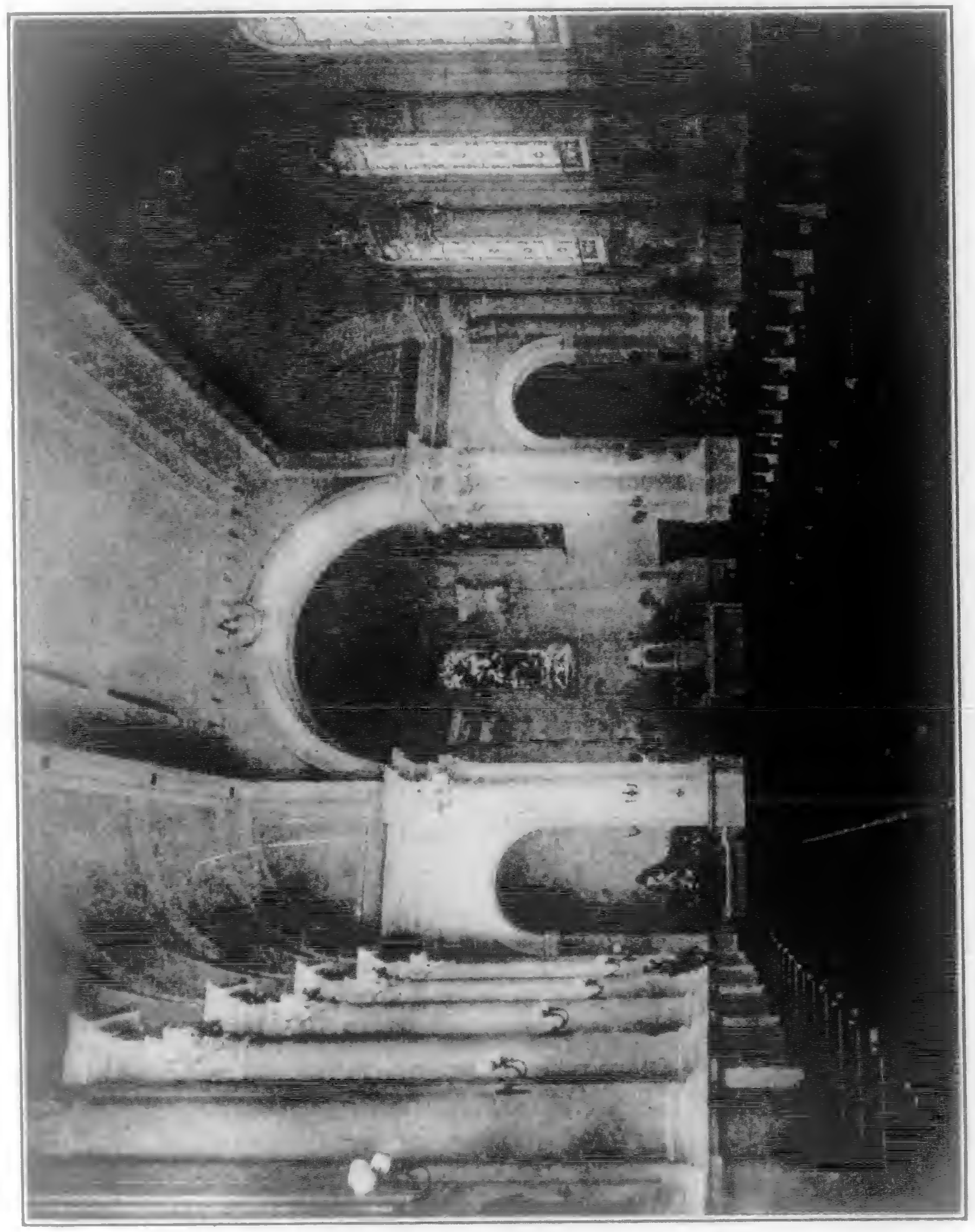
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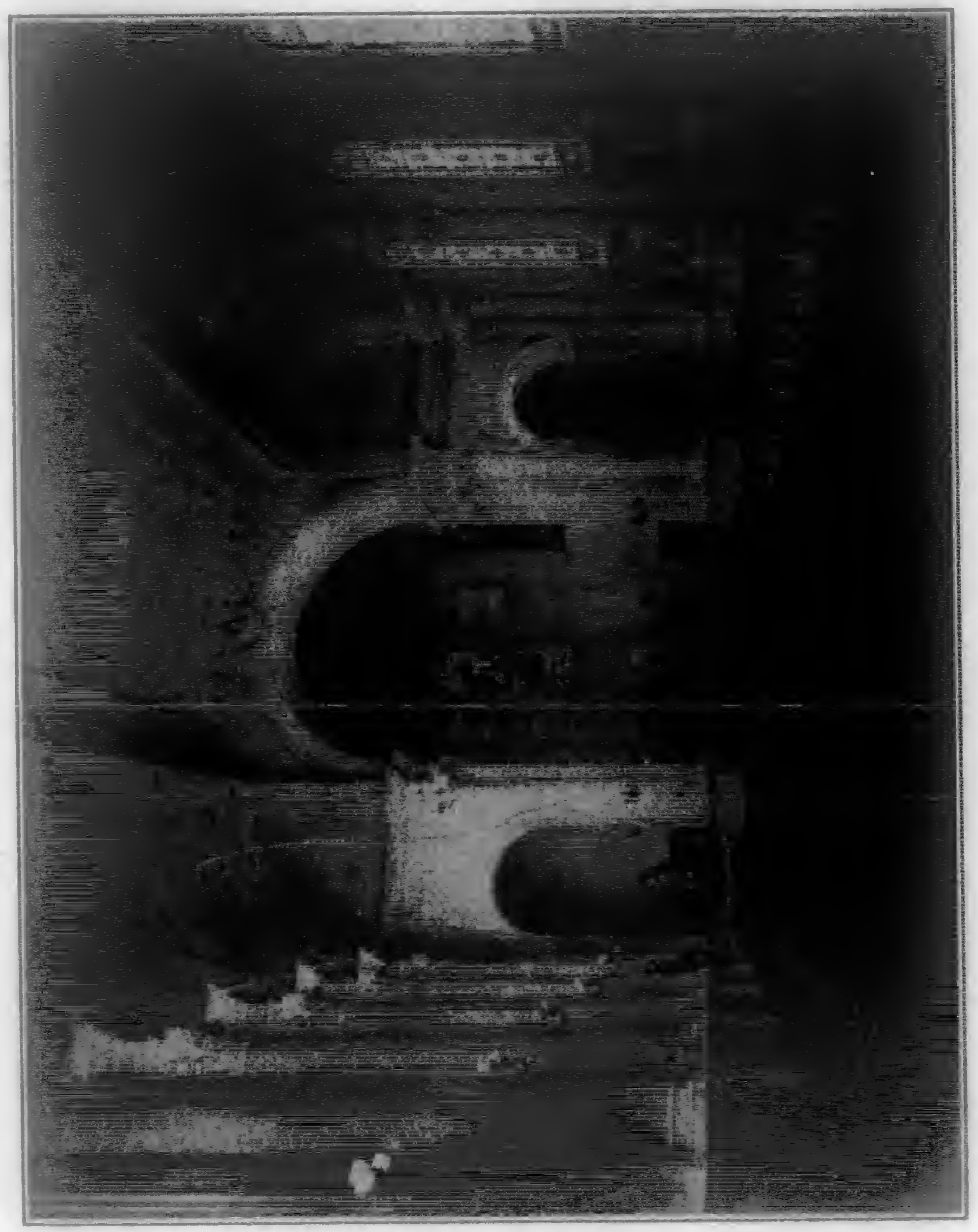
Interior of Catholic Church, San Mateo, Cal.
Albert Pissis, Architect



Crematory in Cypress Lawn Cemetery, San Francisco
Albert Pissis, Architect



The Rosenstock Mausoleum
Albert Pissis, Architect



Interior of Catholic Church, San Mateo, Cal.
Albert Pissis, Architect



Crematory in Cypress Lawn Cemetery, San Francisco
Albert Pissis, Architect



The Rosenstock Mausoleum
Albert Pissis, Architect



The Sloss Mausoleum
Albert Pissis, Architect



Loaiza Residence, San Francisco



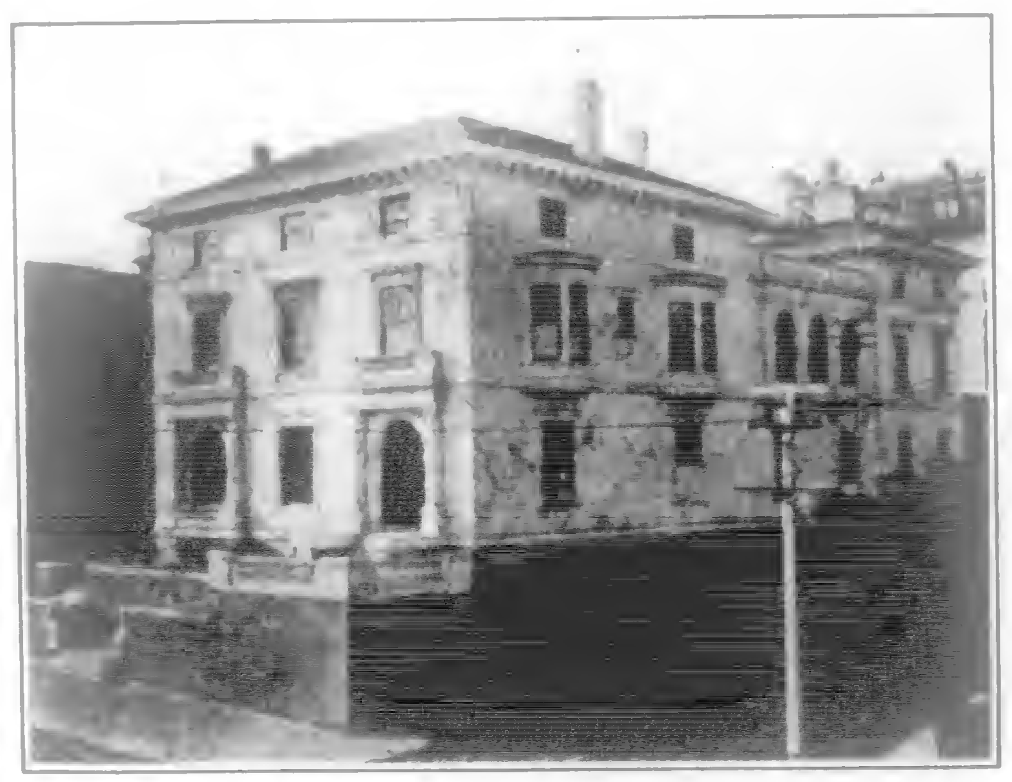
Residence, San Francisco
Albert Pissis, Architect



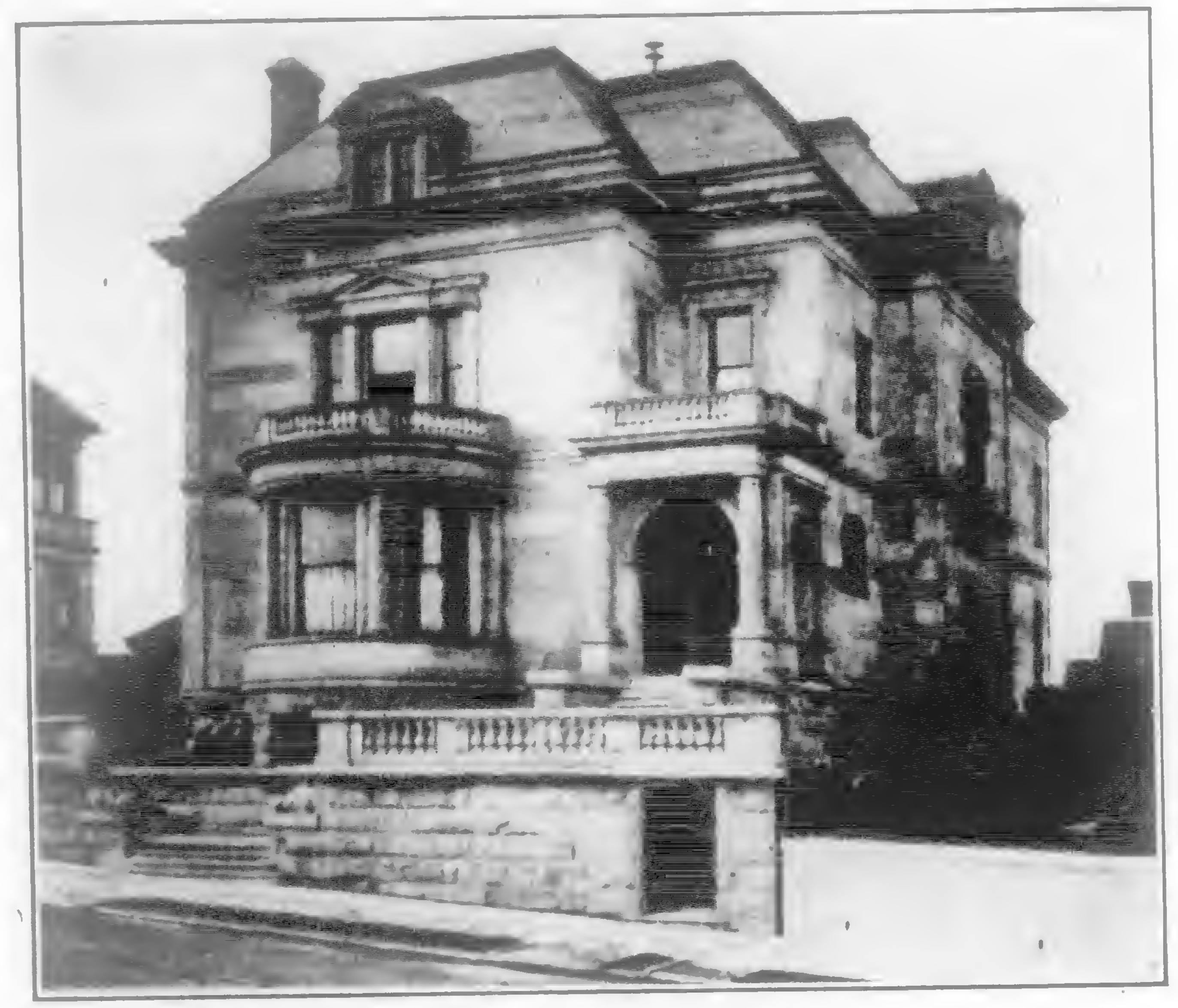
The Posadas Residence, San Francisco
Albert Pissis, Architect



The Sloss Mausoleum
Albert Pissis, Architect



Loaiza Residence, San Francisco



Residence, San Francisco
Albert Pissis, Architect



The Posadas Residence, San Francisco
Albert Pissis, Architect



Detail of Marchand's Restaurant
Albert Pissis, Architect



Residence of Benj. Ide Wheeler,
President of University of California
Albert Pissis, Architect



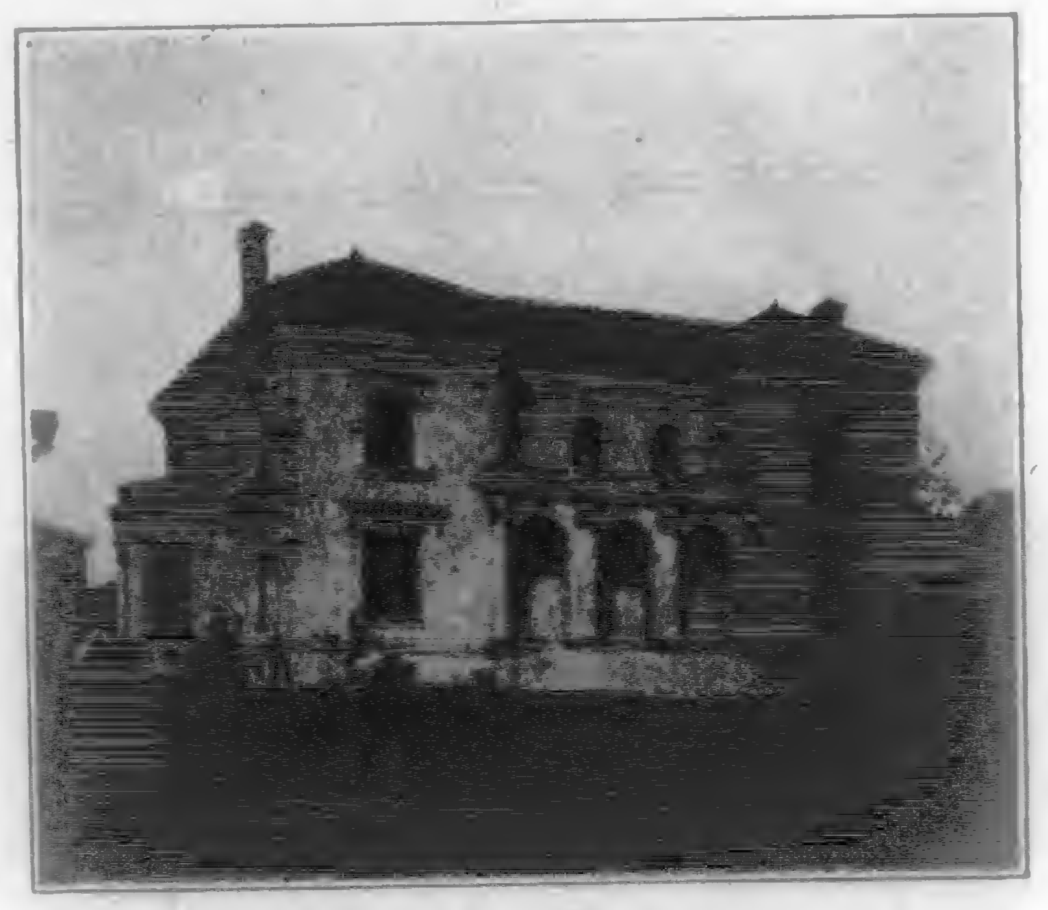
Building, San Francisco
Albert Pissis, Architect



Royal Insurance Building,
San Francisco
A Splendid Example of
Artistic Brickwork,
Howells & Stokes, Architects



Detail of Marchand's Restaurant
Albert Pissis, Architect



Residence of Benj. Ide Wheeler,
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Bank of Burlingame Building, Burlingame, Cal.
Wm. H. Weeks, Architect

The Construction and Cost of Small Concrete Houses

By C. R. KNAPP.

THE use of concrete for small buildings presents a vast field for operation. Its use for larger buildings has proven its efficiency and is attracting the attention of men interested in the building of homes. The question of cost is naturally of great importance to such men.

Frame construction is of such a character that its cost has a considerable range depending on the manner in which it is put up, but a first-class frame house will cost more than concrete.

Brick construction will cost for a 13-inch wall from 36 cents to 50 cents per square foot of wall and a nine-inch wall will cost from 25 cents to 35 cents per square foot of wall. To these figures must be added, for the finished wall, cost of furring, lathing and two brown or scratch coats of plaster and the white coat.

Hollow-tile construction, which has an advantage over brick by reason of its air space, averages about the cost of brick or a trifle under.

The cost of block construction is from 18 cents to 35 cents per square foot of wall, having a thickness of eight to twelve inches, inclusive. For the finished wall, add the cost of the white finish coat, which is put directly on the concrete, thus saving the cost of furring, lathing and the two brown or scratch coats of plaster.

A hollow reinforced concrete wall will cost from 15 cents to 25 cents per square foot of wall, plus the finish coat.

A six-inch wall with furring, lathing or metal sheathing will cost 11 cents to 18 cents per square foot for the concrete, plus the furring, lathing and plaster.

Two-inch partitions will cost 16 cents to 20 cents per square foot of concrete floors cost from 25 per cent to 40 per cent more than wooden joist construction rooms, but little more than wooden shingles.

Properly constructed, artistically finished concrete homes will, in the writer's opinion, find ready acceptance when it is realized that they are permanent, fireproof and can be erected at moderate cost.

The Relation of Engineering to Architecture.

By C. DERLETH, JR.,
Professor of Civil Engineering, University of California.

LAST February the writer delivered a lecture before the Architectural Association of the University of California on the important subject of the influence of engineering construction upon architectural interpretation. The remarks were made extemporaneously, illustrated by lantern-slide views. No notes were taken; therefore, what follows is only a short transcript from memory of the ideas presented. I shall attempt to give here merely a statement of the principle involved in the discussion. I shall fail to a certain extent to make that principle clear, because there are no illustrations accompanying this fragmentary statement.

Early forms of construction cannot be said to have been influenced by engineering ideas and ideals as those ideas and ideals are understood by the present generation. In Egypt under Pharaohs and Ptolemys, in Greece before the Christian era, in ancient Rome and her provinces, important structures, whether monuments of architectural art, such as temples, or masterpieces of constructive skill, such as bridges or aqueducts, were built of massive proportions, with safety factors so large that calculations for strength were secondary considerations. The science of mechanics was unknown to the Egyptians and early Greeks; its rudiments were but vaguely understood after the days of Archimedes and Hero, and little used or forgotten in the early Middle Ages. Labor was so cheap that building requirements did not demand economic structures. Religious zeal produced buildings that have been the admiration of civilized peoples for centuries.

With the opening of the fruitful period of the Renaissance, new strides were made by an awakening Europe; new ideas were introduced. The great cathedrals of England, France, Germany and Italy attest to the empiric engineering knowledge of the builders of those days. Palladio introduced the idea of the truss; such men as Da Vinci, Michael Angelo, Wren and others developed forms of structure so bold in proportions that they necessarily were dependent for their safety, to at least a substantial extent, upon a keen appreciation of the requirements of equilibrium, upon a critical knowledge of the strengths of the materials used. For their pointed arches, their massive pillars, their flying buttresses and their lofty spires, it is certain that the great architects of the early Gothic churches must have mastered at least an experimental analysis for strength and equilibrium. That they used weighted strings to determine the positions of lines of pressure for their bold arches, high buttresses and deep foundation footings, is beyond doubt. It was in those days that the science of graphic statics had its experimental beginning. Galileo attempted the investigation of lines of stress in beams, though we now know that his conclusions were erroneous. Philosophers like Newton advanced by colossal steps the knowledge of mechanics and the action of forces. Still, social conditions made labor and material cheap, while religious devotion urged all, workmen and architects, to slave for results irrespective of those commercial requirements paramount in our construction problems today.

With the opening of the nineteenth century, conditions were profoundly changed. Science made gigantic strides; the laboring and middle classes awoke to the rights belonging to them as taught by social and industrial philosophy, a philosophy born in the times that marked the downfall of Charles I of England, a philosophy strengthened by the success of the American Revolution and emphasized by the terrors which rent France and prostrated

Europe in Napoleonic days. With the manufacture of Portland cement and Bessemer steel new impetus was given to a movement already accelerated in its progress by the invention of a successful steam engine and the practical realization of steam railroads. By 1850 the science of modern engineering was firmly established. What its achievements have produced in the last twenty years would be unbelieveable were we not eye-witnesses. The great monumental structures of the present are more than architectural creations; they are equally the result of scientific engineering study. Today we must build with sufficient strength, but never so massively that economy shall be neglected.

In ancient and mediaeval times the principal materials of construction were wood and stone; the beam and the arch the means for spanning openings. In our generation we have added, as mighty factors, the use of Portland cement concrete, of steel, of reinforced concrete; while the science of mechanics and the mechanical inventions have made real and living constructions that eclipse the wonders of the old world. Great steel framed buildings, enormous trusses, domes, fireproof construction, and the like, assert their importance to the architects. Long span suspension bridges, cantilevers, viaducts, tunnels, canals, and their appurtenances, submit difficult problems to the engineer and force him to realize that success is not complete until ideas of art and architecture have given counsel to him.

Two groups of construction problems present themselves: (1) monuments of architectural creation which cannot neglect the teachings and influence of engineering science without becoming mechanical monstrosities; (2) great works of engineering design which resut in satisfactory strength and required economy, but which thrust upon the public their supreme ugliness of proportion and ornament unless the talents of the engineer have been blended with the advice of the architect.

I now can state the principle brought out by my lecture. Modern architectural creations, no matter how masterful the adornment, fail as examples of true art unless they interpret the mechanical structure, unless they give a rational treatment to the materials used. Present day engineering works of magnitude may be perfect when analyzed for strength or calculated for economy, but they wound the aesthetic feelings of the community unless their proportions are graceful, their ornament dignified, their treatment fitted to the environment in which they are placed, and last, but not least, unless their general appearance is suggestive of the work done by the structural skeleton in maintaining equilibrium.

In many respects the engineers are the greater offenders. In the past two decades epoch-making bridges have been built in America, heroic in their magnitude and grand in the boldness of their conception, at the same time that they are supremely ugly. Similar European works are not open to this criticism to so full an extent. Notable arches in France and Germany may be cited as examples of the fortunate combination of engineering with architectural skill. From the nature of things, the arch and the cable present pleasing curves; therefore, even in the United States, one may refer to handsome structures like the Brooklyn suspension bridge and the Washington arch bridge at New York City. In the main, however, the recital would claim one long list of eminently crude and ugly monuments. In the last twenty years numerous cantilever and simple truss bridges have been built so disagreeable in their appearance that their ugliness makes them notable, if not beautiful. Recently reinforced concrete has been employed for city buildings and for highway bridges with the same discouraging effects. Where steel structures might have been more pleasing, due to a sane treatment of masonry piers and approaches, every possible advantage has been discarded to save a few dollars. Recent attempts to ornament steel trusses have been

hideous failures; attempts which cost money and therefore cannot be ascribed to a desire for reckless economy. For the engineer's phase of this question, the signs of the times point to improvement. Great structures now under way have their consulting architects. Some cities, like New York, have their art commissions which pass upon the aesthetic qualities of the designs for proposed notable public structures. Thus, recently in New York, designs for gigantic bridges over Spuyten Duyvil and Hell Gate waterways have been disapproved. The appointment by the President of the United States of a fine arts commission to pass upon designs for public structures is another indication of progress, both for the engineer and the architect.

In my judgment the worst offenses are being perpetrated daily by architects who have in charge the designs for municipal buildings. I refer in particular to the steel framed skyscraper office building and the new creation known as a reinforced concrete house. I do not wish to be considered more severe in my criticism of the architectural side of this question. As an engineer I am alive to the artistic short-comings of our engineering work. But it is peculiarly necessary that greater emphasis should be placed on a criticism of the modern methods and practice for the design and construction of average city buildings. Architects are remarkably ignorant as a class, of even the elements of the science of mechanics. Most of them know little, and care less, about the elastic properties and strength of such materials as steel, cast iron, wood or concrete.

They will tell you that a study of mathematics and mechanics hurts their artistic taste and stunts their artistic instinct. To a certain extent this may be true, but surely a slight appreciation of those facts which are all-important in a rational study of the skeleton of a skyscraper design cannot be neglected. It is not necessary for an architect to be a professor of mathematics or a consulting engineer in order that he may know that it does not look well to rest a brick pilaster, twenty stories high, upon a glass show-window of the store front, first floor. Is it not an ugly conception which places an imitative voussoir stone elliptic arch of shallow rise, shallower ring depth, and absurdly long span across the front of a loft building? Yet such examples may be found in number on Market street, San Francisco, or in any other city.

In the history of things the architect is looked to by the owner as the responsible builder. The owner does not concern himself with the problem of construction. He deals directly with his architect and wants the best building for the lowest cost. It rarely occurs to him to consult jointly with an engineer and an architect. Hence, in most cases, the architect either buys the necessary engineering advice or he hires a so-called structural engineer. Most architects are unable to judge of the ability of the consulting engineer whose report they buy, and less able to weigh the value of the service rendered by the hired work done by a structural engineer whom they directly employ. They are usually willing to take advice which costs little; consequently they get engineering talent which is worth less. In the past six months at least three important buildings to be erected in San Francisco have had their original plans discarded as a result of expert engineering advice. In one notable instance four independent studies were made before the plans finally passed. Much labor, considerable time and money could have been saved by employing a competent engineer in the beginning.

It is a mistake, and it certainly is not true art, to blindly follow the styles and orders of past ages. Architectural treatments that by common consent are considered perfect for massive stone buildings, and which have stood the critical test of time, are obviously not suited to present-day problems without some modifications, where the materials are primarily structural steel and reinforced concrete instead of stone masonry. A new order of architecture, for high buildings, must be developed, not in a day, but by careful

study of the lessons taught by experience. No architect can be a helpful factor in such a development who does not appreciate the engineer's problems, who considers engineering requirements of secondary importance, and who, by the nature of his purely artistic training, lacks the ability to interpret by his architectural exterior the nature of work done by the engineering structure within.

* * *

Architects Condemn New State Law.

AN IMPORTANT state law was passed by the last California State Legislature and approved by Governor Gillett, which evidently escaped the notice of architects and owners interested in apartment buildings until it was too late to prevent its enactment. In San Francisco the effect of the law is being felt to considerable extent, and several suits are pending regarding it. The act is one of unusual significance, as it practically prohibits the erection of an apartment building on a lot having two frontages. The section dealing with such buildings having fronts on two streets was not noticed until after the act became a law and was signed by the Governor.

It seems that when the act was before the Legislature, after its introduction by Senator Burnett, no attention was paid to it, for the reason that its title was, "An act to regulate the building and occupation of tenement houses," etc. In defining a tenement house, however, the act describes it as any house or building which is rented to be occupied as the residence of three or more families living independently, and doing their own cooking upon the premises, or by more than two families upon any floor so living and cooking, but having a common right in the stairs, hallways, yards, water closets, or some of them.

Section 23, which seems to be the most objectionable and one which architects and attorneys say applies also to apartment houses, is as follows:

"Whenever a tenement house is hereafter erected upon a lot which runs through from one street to another street, or alley of not less than sixteen feet in width, and said lot is not less than eighty feet, nor more than one hundred feet in depth, there shall be a yard space through the center of the lot midway between the two streets, which space shall extend across the full width of the lot, and shall never be less than twelve feet in depth from wall to wall, and shall be increased in depth as prescribed in Section 22 of this act. Such yard space shall start at the level of the second tier of beams, but never at a point more than fourteen feet above the curb level. Where such lot is over one hundred feet in depth such yard space shall be left through the center of the lot midway between the two streets, and shall extend across the entire width of the lot, and shall not be less than twenty-four feet in depth, as prescribed in Section 22 of this act. Where such lot is one hundred and fifty feet or more in depth, such yard shall be at every point open from the ground to the sky unobstructed, except by fire escapes and uninclosed outside stairs projecting not more than four feet from the building."

In San Francisco a case has been submitted to Judge Troutt of the Superior Court, with the idea of testing the constitutionality of the law.

Architects Havens and Toepke of San Francisco condemn the new law very severely. It has put this firm to no small annoyance and expense, having prevented the erection of several buildings which they had designed for clients. The Los Angeles chapter, American Institute of Architects, has taken up the matter seriously and an attempt will be made to have the courts grant a temporary relief until the next session of the Legislature, when the law will be either thrown out bodily or amended.

Attorney General's Opinion of the Law Regulating the Practice of Architecture in California

EDITOR The Architect and Engineer: Herewith is a letter giving the opinion of the Attorney General in regard to the act regulating the practice of architecture in this State. We are sending this to you for publication, as it should be of interest to the architectural profession in general.

Yours sincerely,

LIONEL DEANE, Sec'y N. D.

San Francisco, June 19, 1909.

Hon. Frederick L. Roehrig, Secretary California State Board of Architecture, Los Angeles, California.

Dear Sir: I am in receipt of your request, under date of May 8th, in which you ask the opinion of this office upon the following matter:

"A regular certificated architect failed to pay the annual license tax required by amendment of March 26, 1903, to the act regulating the practice of architecture in this State approved March 23, 1901. Thereupon this board issued its certificate to the Secretary of State revoking the certificate of the delinquent architect, and the Secretary of State cancelled the architect's certificate in the manner and form required by the act. Will you kindly advise this board whether or not on payment of all delinquencies this board has the power to rescind the cancellation of the certificate and reinstate the architect or whether a new certificate must be issued."

That portion of the act to regulate the practice of architecture from which your board derives its power to cancel the certificate of an architect who shall fail to pay the lawful license fee each year, is found in Sec. 7 of the act, which section was added to the original act in 1903. In part, Sec. 7 reads as follows:

"Each regularly certificated architect shall pay an annual license fee of five dollars, said fee to be paid to the secretary of the board of the district of which he shall be a resident, and shall be payable in advance on January one, and shall become delinquent the first day of April, of each year, after which date it shall be delinquent, and the certificate of such architect who shall fail to pay their license fees by April one of each year, shall be subject to cancellation by said district board, and notice of such cancellation shall be sent to each county recorder of the state of California and to the secretary of state, as provided in section five of the act to regulate the practice of architecture, approved March twenty-three, nineteen hundred and one, for cancellation of certificates."

You will notice specially the wording of this section to the effect that when such annual license fee shall become delinquent, "Certificate of such architect . . . shall be subject to cancellation . . . as provided in Sec. 5 of the act to regulate the practice of architecture . . . for cancellation of certificates.

This section, by reason of the phraseology last cited, falls within that class of statute known as "Reference Statutes"; in other words, the reference made in Sec. 7 of the act to Sec. 5 of the former act, places the operation of Sec. 7 under the control of the provisions of Sec. 5, and conceding the power of the board to cancel a certificate for non-payment of annual license fees, we must look to the method provided in Sec. 5 for the exercise of such powers.

It is apparent, with this rule in view, that "cancellation," as used in one section, is synonymous with "revocation," as used in the other, and that the action of the board in either instance results to the same effect.

Statutes granting powers to administrative boards, which manage and carry into effect the will of the Legislature, and especially statutes dealing with the imposition of taxes, fines, and penalties, must be strictly construed, and the powers of such a board must plainly appear from the letter of the statute itself. There are certain implied powers possessed by an administrative board, which, at times, may be read into the provisions of the statute, but an implied power is only such a power as is necessary for the purpose of carrying out the intendments of the law.

Judge Cooley, in his work on Constitutional Limitations, at page 194, defines implied power thus:

"Implied powers are such as are necessary in order to carry into effect those expressly granted, and which must, therefore, be presumed to have been within the intent of the legislative grant."

Considering the provisions of the law dealing with the revocation or cancellation of an architect's license, we are lead to the conclusion that an adequate method has been provided to accomplish the same, and a time fixed when such action may be taken. Furthermore, we find in Sec. 5 the provision of the law dealing with the reinstatement of such architect, whose certificate has been cancelled. Such provision reads as follows:

"After the expiration of six months, the person whose certificate was revoked may have a new certificate issued to him by the Secretary of State, upon the certificate of the District Board by which the certificate was revoked."

As Sec. 7, which provides for cancellation because of non-payment of license fees, refers to Sec. 5 (as I have heretofore pointed out), then this provision for reinstatement applies equally to the reinstatement of an architect whose certificate was revoked for non-payment of the license fees, and fixes not only the time when such action may be taken by the board but defines the method to be pursued, and in its terms contains a self-operating penalty, which, no doubt, the Legislature deemed wise should be imposed upon those who disregard the law.

No implied power can, therefore, be presumed to enlarge the purposes of this law, for it is not apparent that anything need be implied to carry the law into effect.

A license is a personal privilege, granted to an individual upon the terms and conditions defined by the statute under which it is granted, and becomes a contract, upon its acceptance, between the individual and the State. It lives until the period for which it is granted has expired, or until revoked in accordance with the law. Upon its revocation, in accordance with the law, it ceases to have any force or validity, and places the individual who possessed it in position as though he had never been granted the privilege which such license conveyed. The applicant, therefore, was obliged to take certain jurisdictional steps before the granting powers had authority to issue such license to him, and when it has expired, is not subject to revivification, unless this statute specially permits, and then such action can only be consummated in the method defined by the law.

I would, therefore, advise you that in my opinion, when your board has once cancelled, for any reason, a license issued to an architect in this State, that such architect can only be reinstated at the time and in the method pointed out in that portion of Sec. 5 of the act which I have hereinabove cited to you, and that your board has no power, by resolution or otherwise, to rescind a prior decision revoking a license, and that no resolution rescinding a prior decision revoking a license will reinstate the architect in question or revive the license formerly revoked.

Yours truly,

(Signed) U. S. WEBB, Attorney General.

By Raymond Benjamin, Deputy.

New York as Seen by a French Architect

Some Pointed Criticisms, with a Reply by a New York Architect.

A FRENCHMAN, by the name of M. Augustin-Adolphe Rey, who recently visited New York, has been the cause of one of the pleasantest and breeziest diversions along the line of architectural criticism, that has taken place for a long time. M. Rey sped about New York in an automobile with a reporter of the New York Times, and as he glanced at the buildings gave voice to his ideas. The reporter extended them to the limit of a full page, and it was not long before all New York architects were talking of them. Some wondered whether the French critic was really competent. Others denounced him privately, and some believed him fairly correct in his conclusions. But it remained for Mr. Herman Kobbe, a New York architect, to reply in print. Mr. Kobbe's views were also given a full page in the New York Times.

M. Rey came to this country to attend the International Congress of Tuberculosis, held at Washington recently. Since the beginning of his career he has taken particular interest in buildings embodying ultra-modern utilitarian and hygienic principles. Among the buildings in Paris built by M. Rey are the Asylum for Young Orphans, the Home for Apprentices and Young Workmen, the Model Dwelling House for Workingmen's Families, and others of similar character.

" 'Beautiful, beautiful!' he cried as he caught sight of the City Hall. But, as he drew nearer to the heart of the skyscraper region his remarks became more and more uncomplimentary. The Times article goes on to say:

"The Park Row building displeased him. 'One side of it,' he exclaimed, 'is an entirely bare wall. What difference does it make how the other sides are treated? And look at that!' he cried, pointing out the St. Paul building and the National Park Bank nestling beside it. 'What a jarring effect those perpendicular and horizontal lines make! How easy to have built the second building with some sort of reference to the style of the first!'

"The automobile had reached Trinity Church. M. Rey looked with great disgust at 1 Wall street, the tall brick building on the corner of Broadway and Wall street.

" 'The worst thing in New York!' was his comment.

" 'Ha! this is good!' he remarked as the car sped by the new Customs House. 'But the roof is bad—very bad. It should be higher. It looks as if they had not money enough to make a good roof!'

"As the automobile sped further and further uptown M. Rey began to find things more to his liking—though the lofty Decker and Bank of the Metropolis buildings in Union Square, jammed close to each other, each robbing its neighbor of all effectiveness, once again made him shake his head sadly. But he was partially consoled by the Flatiron building.

"He liked the art gallery behind J. P. Morgan's house on East Thirty-sixth street, though objecting a bit to the upper part of it. But where his enthusiasm broke out in full force was before the Gorham building, on the southwest corner of Fifth avenue and Thirty-seventh street.

" 'That is the most beautiful business building in the world!' he exclaimed again and again.

"But he was not carried away with delight by the new Public Library.

" 'It is good,' he said, 'but the attic story is far too high for the rest. The Forty-second street front, it seems to me, is better than the main front. I feel sure that in course of time from three to four feet will have to be removed from the attic story of the library. Such a defect must be corrected.'

"He was vehement in his disapproval of the Metropolitan Museum of Art.

" 'The columns,' he said, 'are good—they give the idea of a Roman triumphal arch. But the heavy horizontal lines breaking the perpendicular lines of the arches at the sides of the entrance ruin the effect. Instead of those horizontal lines there should be statues, so placed as not to break the perpendicular lines, which give the effect of bigness.'

"The Times building he called good—'a real tower.' As for the Metropolitan Opera House, he was pretty well disgusted with it. 'That is not an opera house,' he declared, viewing the offices on the ground floor and the windows of the apartments above with immense disapproval.

"Vehement as was his outburst concerning the Metropolitan Opera House, it sounded like bouquet throwing compared to his tirade against the new Pennsylvania railroad station on Seventh avenue.

" 'What—a railroad station!' he exclaimed, as the automobile slowed up in front of the great white colonnade. 'Why, then, is it built like a Roman temple? What is the use of all those columns on a railroad station?

" 'If there is one thing to which the newest ideas in architecture should be applied it is a great railroad station. The railroad belongs essentially to modern times. And yet you apply to your greatest railroad terminal bric-a-brac borrowed from bad ancient architecture. Why, if the Romans had possessed a single railroad they would have evolved an architecture exactly adapted to it.'

" 'The Pennsylvania station is a great mistake—a splendid white stupidity. As a library it would be good—for its real purpose it is a colossal mistake. Why, the only way to make it appropriate is to have the railroad company see that every ticket sold in it is printed in Latin and order that only Latin be spoken by every employee in the place!'

" 'Architects should bear in mind four things—utility, health, beauty and gayety. New York architects have thought of nothing, as a rule, but utility. Yet, if certain restrictive laws were passed regarding skyscrapers and towers, they would soon see that utility and beauty are exactly the same thing.' "

Mr. Herman Kobbe's article in the Times is in part as follows:

Broadway called forth from him the verdict, "Too narrow, too narrow." In saying this he expressed what all men of science, and most Europeans who are not even men of science, see immediately to be the most glaring inconsistency in our society—that we sacrifice the greater part of our speed by unnecessary hurry. It is a simple sum in arithmetic, this seemingly unsolvable problem of traffic. With twice the width of street there would be only half the present number of people per square yard, and consequently no blocked traffic.

The evident disadvantages of the overcrowded streets are made worse by the disadvantage of bad light. Our French visitor suggests as a possible solution of the narrow street problem to cut arcades through the ground floors of office buildings, adding their area to that of the sidewalks. This suggestion is good for lack of a better alternative, but it would cure only the congestion of traffic, and would not better the light problem. It is the depth of the street divided by the width between opposite building fronts that determines the amount of light, so no matter what the actual dimensions are, the only way to have efficient living or working light conditions is to establish a sensible proportion between the depth and width of every street.

Our guest sees New York a city of white towers. This is an excellent suggestion, as is his remark on the darkness of much of our renting space.

Not so good is his criticism of the Customs House. From his point of view he is right, but a little reflection will show that French logic is not always applicable to foreign things. The roof in question contains an extra floor of the same height as the attic immediately below it. This to any sensible Anglo-Saxon is reason enough for not making the roof any higher, unless

the present height gives an unpleasing effect considered decoratively without reference to use. The Frenchman's objection was not based on the undecorativeness of the roof, however, but on its parsimonious appearance. To call it too small when it fulfills a practical need is like calling a collar button too small because a hat is much bigger.

The criticism of water tanks visible on buildings is mere common sense, and such as a child might make. But far less logical is the Frenchman's condemnation of brick. In his opinion "bricks are good enough for Brooklyn." He might have said for Brooklyn, Venice, Vienna, Blois, and Versailles without historical inexactitude. Far from being not good enough for New York, New York is not good enough to appreciate red brick. As long as we love red brick faced with white, we may take that as a symptom that we are a sturdy race.

Brick may be inelegant to modern French eyes, but so is a natural sunburned complexion. No amount of adverse criticism against brick building will convince us that we are too good for it until we have an altogether superficial and feeble view of life.

M. Rey thinks the Vanderbilt houses "fine," and is pleased by the way a neighboring house has adapted itself to one of them. This criticism shows clearly how a critic can never put himself into the shoes of a race foreign to him. He sees houses practically copied from certain castles which played a prominent role in the traditions of his own land, and he naturally is drawn to them just as he would be to a compatriot in a foreign land. We would be mightily pleased if we came suddenly upon some copy of Mount Vernon in a French countryside; but imagine how it would jar the Parisians.

The closing remarks by our visitor call up mingled feelings in our breasts. "Architects should bear in mind four things—utility, health, beauty and gayety." This is a little like saying, "Men are of four kinds—Europeans, Germans, Americans, and men over 50 years old." Again he would be horrified did he realize how the innocent remark, "Utility and beauty are exactly the same thing," will miscarry in America.

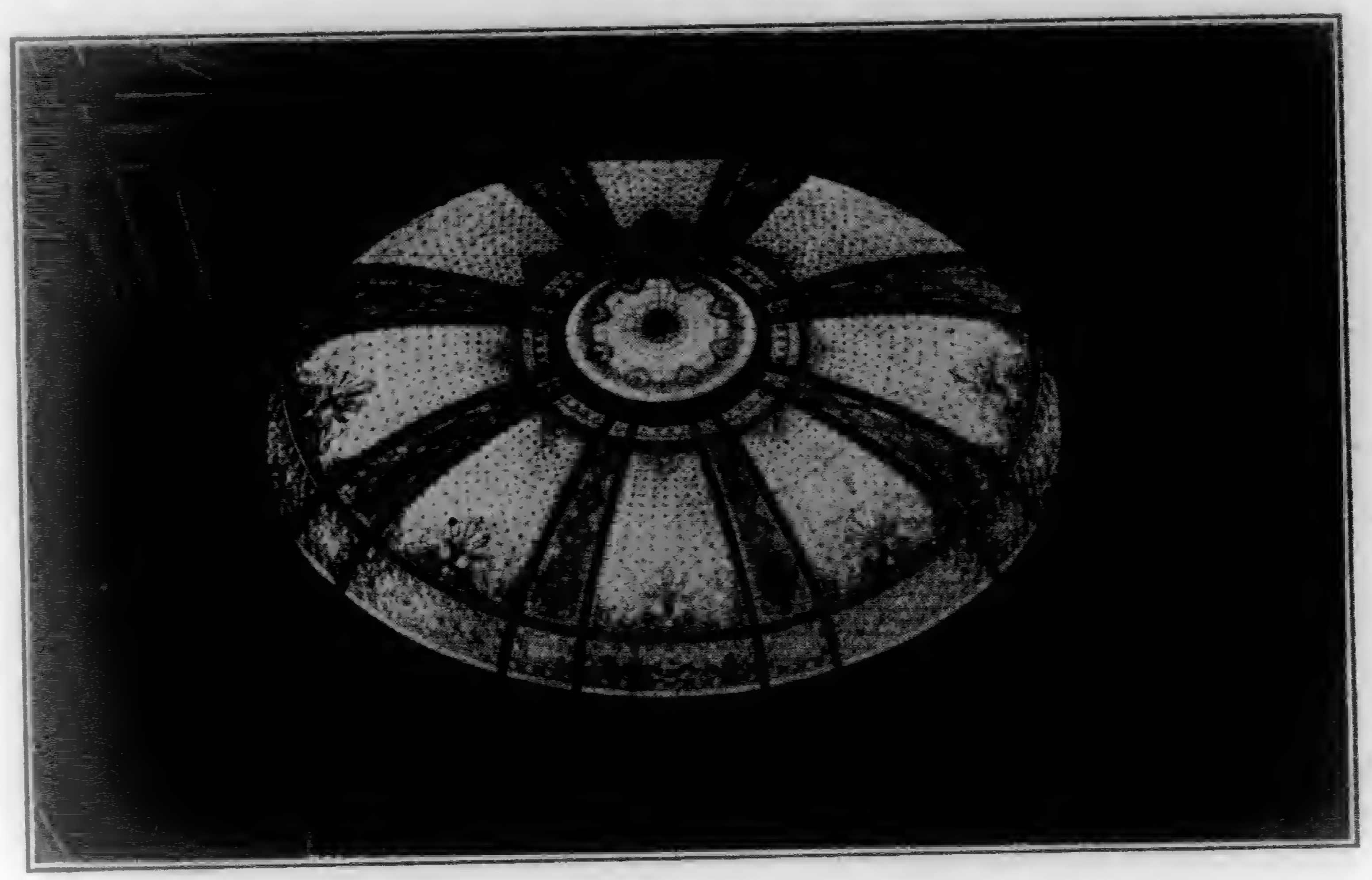
In France one could safely say that without being misunderstood; but M. Rey did not remember that the misunderstanding of that very sentence has been the most besetting misfortune of architecture throughout America. To the American, with his unsensitive imagination, it passes as good. If it is true, a pair of overshoes would be almost the most beautiful things in the world, since they are very useful indeed. When one takes in the full meaning and makes allowances for poetic license, one can call beauty and utility synonymous, but to say so in New York of all places is almost enough to counteract many of the salutary effects of our friend's visit.

* * *

A Bargain

No one opposed,
He proposed,
She was composed,
Also disposed,
So the deal was closed.

He (at the opera)—Just going out for a little fresh air, my dear. She—A slight draught, you mean, I suppose.—Punch.



Art Glass Dome in Hibernia Bank Building, San Francisco
Albert Pissis, Architect

Some Notable Work in Art and Leaded Glass

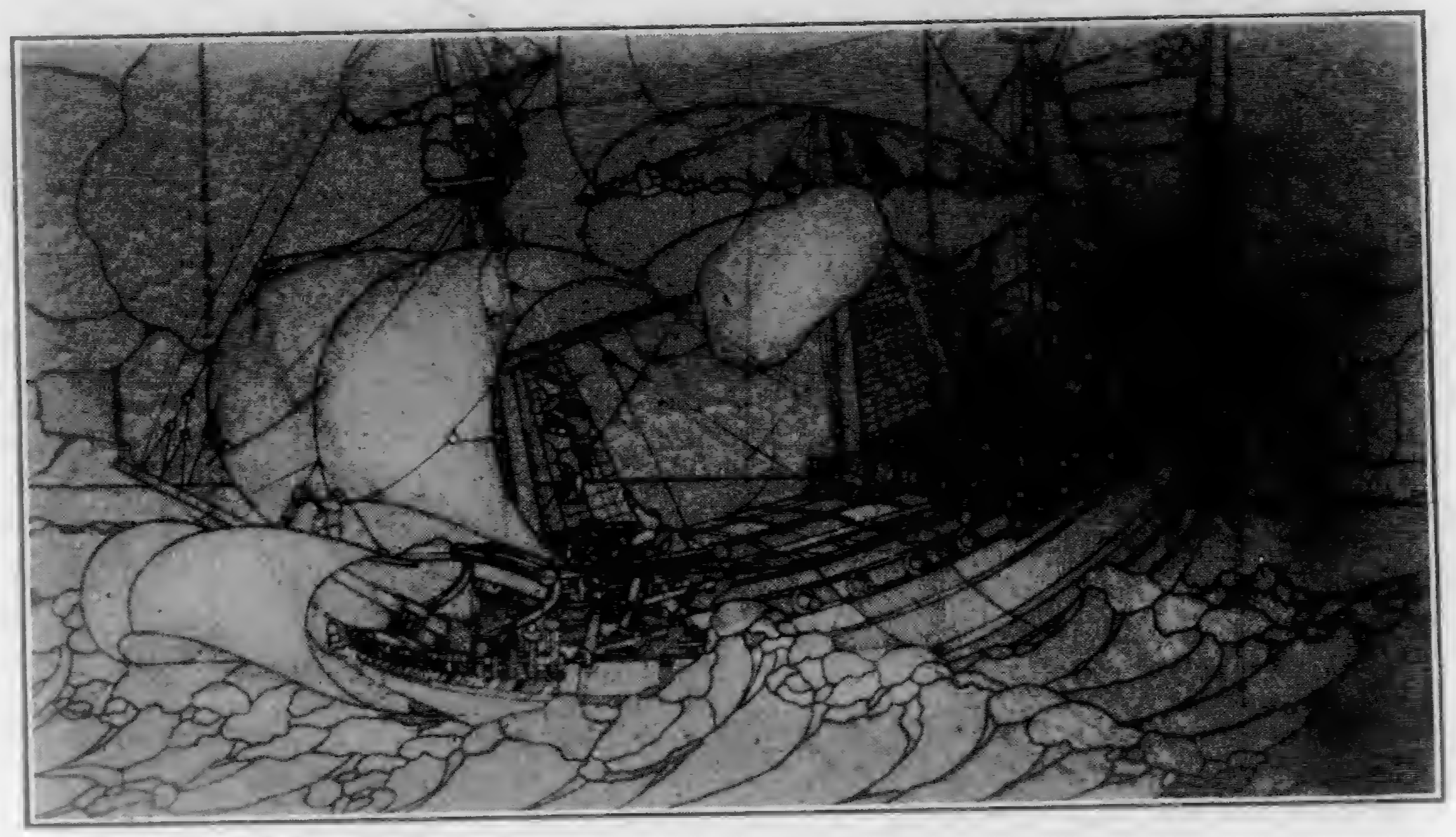
THE handsome art glass domes in the Hibernia Bank building, designed by Architect Albert Pissis and illustrated in this number of The Architect and Engineer, were executed by the United Glass Works of San Francisco, of which Mr. H. R. Hopps is the president and manager. One dome is twenty-five feet in diameter and a second one in twenty by fifty feet. The artist has worked into both domes a soft glow of warm tints which are in perfect harmony with the general color scheme of the decorator.

The United Glass Works is also furnishing the art glass for the Palace Hotel, the largest contract for glass decoration in the history of the business. The color and design of this pretentious piece of work are to be in Louis XIV style. One feature of the Palace art glass scheme will be a complete glass canopy over the spacious central court.

The same firm is making five large art glass mosaic pictures for the Salt Lake City union depot and furnishing the court houses of Sonoma and San Mateo counties with art glass domes.

The beautiful leaded glass panel shown herewith represents a ship of the sixteenth century—a Dutch East India man. To appreciate the amount of labor necessary in preparing a piece of work of this kind one need only to be told that there are over 3,000 separate pieces of glass in the panel.

President Hopps is proud of the fact that his company has one of the largest and best equipped art glass studios in the United States. He delights in entertaining architects and others interested in this attractive phase of the building industry. Mr. Hopps, by the way, is himself a skillful designer, and is the possessor of several medals and honors for his work, chief among which are a medal and a diploma from the World's Exposition in Paris in 1900.



Leaded Glass Panel Executed by the United Glass Works

Reflecting Efficiency of Colors

IN THE April issue of Light appeared an article by Mr. William J. Clark. The article gives the different light-reflecting abilities of various colors. These facts, the writer points out, should be kept in mind when one is furnishing the home, as considerable difference in the light bills will be experienced with the different colors.

Both the color and the kind of surface chosen are important factors in the economy of light diffusion, and in these days of high power radiants, brilliantly lighted shops, shop windows and theaters, when there is a constant demand for more light everywhere, the problem of economical and useful light diffusion becomes an important matter, and one that should be universally considered, as there is no commodity bought or sold that enters more largely into the comfort of living than artificial light, nor, unfortunately, one of which the fundamental laws governing its advantageous distribution are so little understood.

The table given below is taken from the article and shows what a wide range of reflecting efficiency exists between the different colors.

Kind	Color	Reflecting Efficiency
Plain Ceiling	Faint gray cream	.64
" "	Faint greenish	.53
" "	Light yellow	.49
" "	Faint pinkish	.43
Cartridge	Medium light buff	.44
"	Salmon buff	.33
"	Pale gray	.27
"	Light blue	.20
"	Light green	.18
"	Light red	.10
"	Dull green	.07
Crêpe	Medium green	.19
"	Coffee brown	.06
"	Deep red	.05



The Keuffel & Esser Exhibit at the Alaska-Yukon-Pacific Exposition, Seattle, Washington

Notable Exhibit at the Alaska-Yukon-Pacific Exposition, Seattle, Wash.

MUCH has been said about the Alaska-Yukon-Pacific Exposition at Seattle in regard to the beautiful buildings, landscape gardening of the grounds, and the picturesque location on which it is situated, but little has been heard about the individual exhibits, some of which deserve special mention, more particularly those of the Eastern manufacturers, who have spared no expense to give the people of the Pacific Coast an opportunity to see and examine many articles which are not usually found in this section of the country.

While there are many such displays which are creditable, the exhibit of the Keuffel & Esser Company of New York city, in the Manufacturers' building, is of particular interest to Architect and Engineer readers, in that the display includes some of the latest and most intricate instruments used by engineers, surveyors and architects, as well as a number of the latest nautical and forestry instruments now in use by the Naval and Forest Department of the United States Government. A fine assortment of measuring tapes, used in the most accurate measurements in all classes of engineering work, are also shown.

The artistic arrangement of this display is noteworthy. The larger and more expensive instruments are contained in a handsome four-sided case, eight feet square and fifteen feet high, surmounted with a terrestrial globe, on which sets the sphinx, the trade mark of the company.

In front of this case there are two all-glass cases containing the smaller instruments, such as integrators, compensating, polar and rolling precision planimeters, anemometers, current meters, precision pantographs, reckoning machines, etc. At either end of these cases are Venetian flag

staffs, which carry a banner displaying the company's name and trade mark. On the wall, forming the back of the booth, are two frame panels of curves arranged so as to form a scroll design. At one end of the booth are hangings of exterior and interior views of the company's factory. The railing, made of leveling rods and used as posts, from which are draped surveyors' measuring chains, gives a very pleasing effect. The fixtures, which are very handsomely carved and finished in white and gold, were built in San Francisco under the personal supervision of the Pacific Coast manager.

* * *

Cement Production in 1908

THE total production of all kinds of cement in the United States during 1908, as shown by returns received by the United States Geological Survey, from all the cement producers of the country, amounted to 52,775,925 barrels, valued at $44,376,656. This total was made up as follows:

PRODUCTION OF CEMENT IN 1908, BY CLASSES

	Barrels.	Value.
Portland cement	51,002,612	$43,472,679
Natural cement	1,621,862	808,509
Puzzolan cement	151,451	95,468
	52,775,925	$44,376,656

The corresponding figures for the calendar year 1907 are given below for purposes of comparison:

PRODUCTION OF CEMENT IN 1907, BY CLASSES.

	Barrels.	Value.
Portland cement	48,785,390	$53,992,551
Natural cement	2,887,700	1,467,302
Puzzolan cement	557,252	443,998
	52,230,342	$55,903,851

The Portland cement production showed a heavy decrease in 1908 as compared with 1907 in most of the Eastern and Southern States, the loss being greatest in Pennsylvania, New Jersey, New York and Michigan. This decrease in the East and South was offset, however, by remarkable gains reported by plants in the Middle West and on the Pacific Coast, returns from Indiana, Illinois and California showing large increases over the production in 1907.

The average price of the entire Portland cement output in 1908 was only 85 cents a barrel—36 cents below the average price in 1907. The 1908 price is the lowest on record, the previous low point—88 cents a barrel—having been reached in 1904 as the result of business depression in that year.

A report on the cement industry in the United States in 1908 is now in preparation, but this notice is published in advance of that report in order to place the total figures at the disposal of those connected with the industry at the earliest possible date.

* * *

An Innovation

The young preacher officiating at his first funeral wished to give friends an opportunity to view the remains, and not liking the use of hackneyed phrases, announced: "The congregation will now pass 'round the bier!"



Test of thirty-inch Reinforced Concrete Pipe under pressure of ninety-seven pounds per square inch

Eleven Reasons Why Concrete Pipe is Preferable to Salt-Glazed Clay Pipe

1. Salt-glazed pipe warps in burning and slight projections form at every joint where pipes are laid to form a sewer. Suspended matter is caught by these. Cement pipe does not warp, and, therefore, the joints are even.

2. Cement pipes have truer sectional shape and so can be given slanting butt joint, much less costly than bell or spigot joint.

3. Cement pipe is tougher and not as easily broken as salt-glazed clay pipe.

4. Cement pipe, reinforced, has greater compressive, tensile and bursting strength.

5. Strong acids, it is claimed attack cement pipe, but as joints of clay pipe are generally cement, it would affect these as well.

6. Salt-glazed clay pipe advocates claim that cement decomposes, due to physical and chemical changes. There is cement mortar in Rome to-day several thousand years old.

7. Cement tile grows stronger with age; clay grows weaker with age.

8. Cement tile can be easily distributed along the line of the ditch in winter, when haulage is easy, and will withstand alternate freezing and thawing without injury. Clay tile is completely destroyed by such treatment.

9. Cement tile are true to the mold, and, therefore, easy to lay. Clay tile warp in drying and burning.

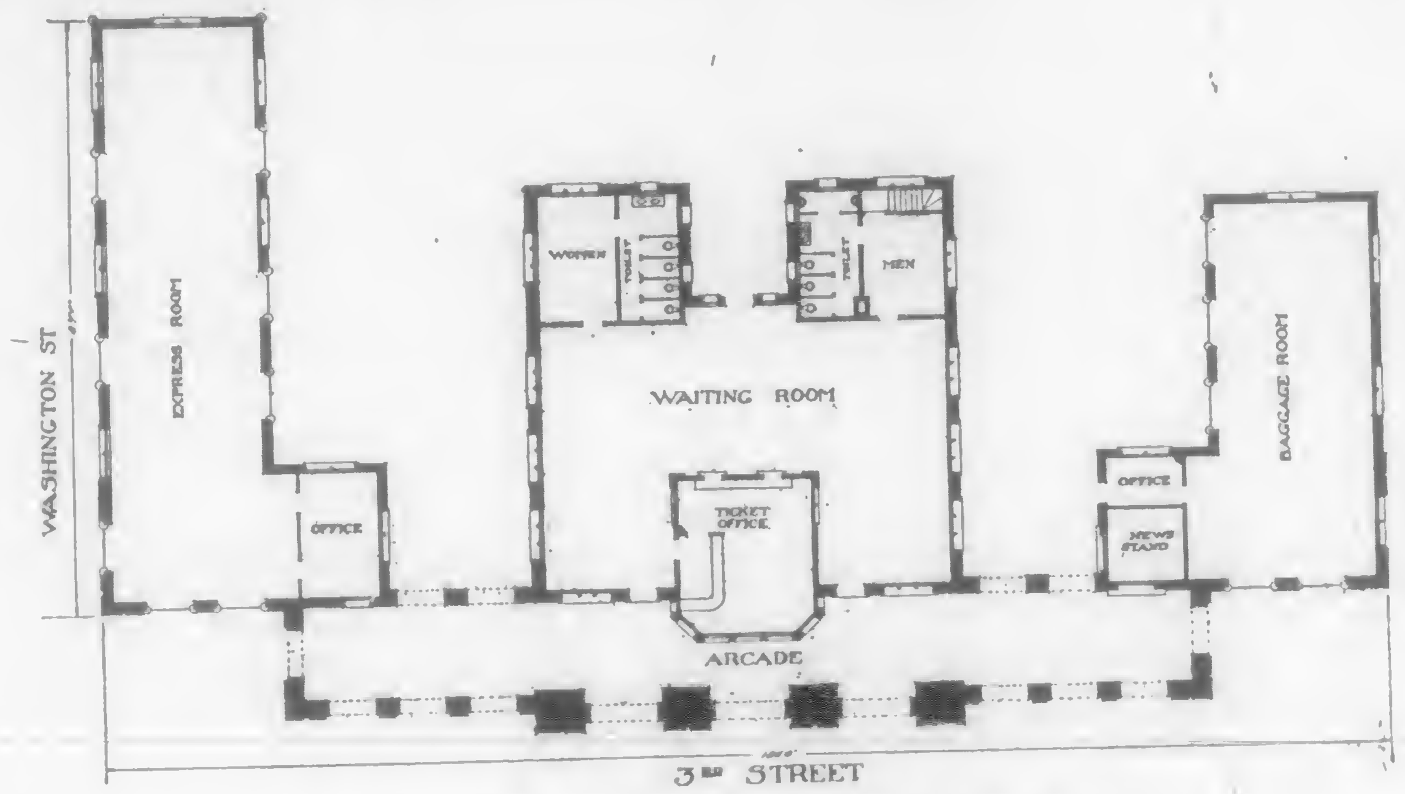
10. Cement tile is cheaper; clay products cannot compete in cost.

11. Salt-glazed clay pipe is not absolutely impervious, due to a lack of thorough glazing, and is, therefore, affected by strong acid the same as porous concrete pipe.

New Depots for the Western Pacific, With Cut of Floor Plan

THE Ransome Concrete Company has begun the erection of a passenger station for the Western Pacific Railway Company in Sacramento according to plans by Architects D. H. Burnham & Co. This building is designed in the Spanish Mission style, being a long, low structure with reinforced concrete walls and roof of red Mission terra cotta tile.

The Ransome Company has also signed direct with the Western Pacific Railway Company for the erection of a concrete passenger station at Third and Washington streets, Oakland. The plans for this station were drawn by the Western Pacific Railway Company's architect, Mr. W. H. Mohr, and show a very handsome group of buildings of the main waiting room, baggage and express rooms, the treatment being on Mission lines.

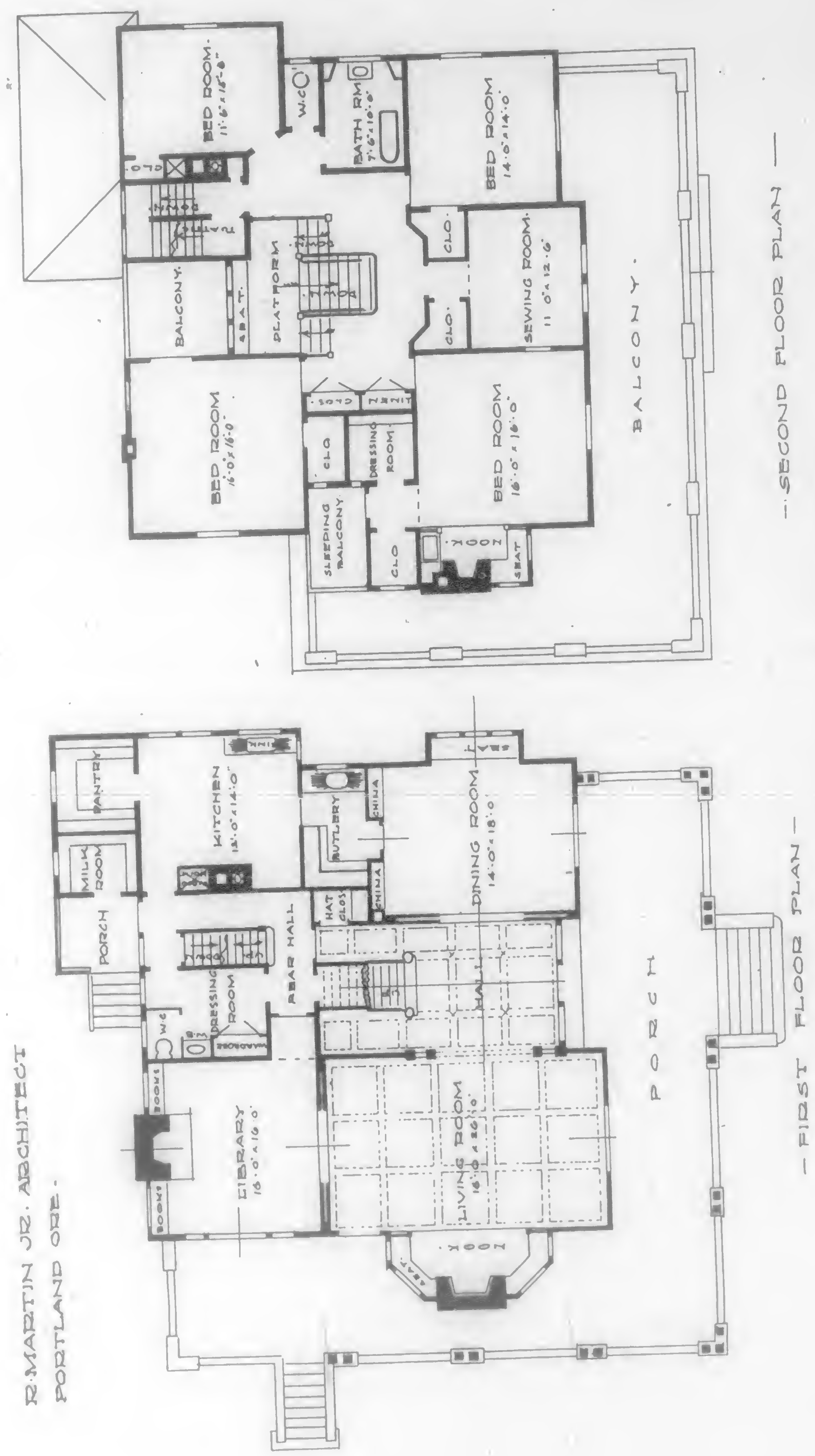


Floor Plan, Western Pacific Depot, Oakland
W. H. Mohr, Architect

Another contract of considerable importance taken by the Ransome Company calls for the erection of a printing house and apartment building on Sixth street, between I and J streets, in Sacramento, the owners being Messrs. Trueblood & Phillips. The first floor and basement of this building will be occupied by the Sunday News Publishing Company and the upper two floors will be used for high-class apartments. This structure is of reinforced concrete, designed according to the Ransome system, and will prove to be quite an innovation in this type of building for Sacramento.

Another contract recently closed in Sacramento covers the foundation and concrete floor slabs for a large incinerator that is being installed in Sacramento by the Decarie Incinerator Company.

In addition to the above work, which has all been started and is under way, the Ransome Concrete Company is pushing to completion the Hotel Sacramento at Sacramento. Work is also going along at a rapid rate on the Columbia Theater in San Francisco, the 670 tons of steel entering into the structure having all been erected. Rapid work is now being carried on in the fireproofing. The Portola Theater, being erected for Thomas Magee & Sons on Market street, near Fourth, with the auditorium on the Stevenson-street side, is being rushed to completion.



First and Second Floor Plans of a Portland Residence
R. Martin, Jr., Architect



Residence at Portland, Ore.
R. Martin, Jr., Architect

Use of Western Yellow Pine for Poles

THE Western red cedar is largely used on the Pacific Coast for poles. In certain interior parts of California, however, the wood is very expensive, owing to the high cost of rail shipment over the mountains, added to the cost of water transportation from the Puget Sound region to San Francisco. In the San Joaquin Valley the native yellow pine, obtained from the surrounding mountains, has been used to a limited extent for poles. This tree has a number of qualities which make it a desirable pole timber, but it is not durable, and decays at the butt in a few years, when set without being given a preservative treatment.

The Forest Service has recently completed a series of tests in the preservative treatment of this wood. An experimental plant was operated near Fresno, California, in which about 600 poles were treated. It was found that the Western yellow pine ranks among the woods which are most easily impregnated with preservatives, and that when thoroughly seasoned, a penetration of from two to three inches was obtained by immersing the butts of the poles in a tank of hot creosote for a period of one hour, followed by five minutes immersion in cold creosote. Owing to the ease with which it absorbs the preservative, Western yellow pine is admirably adapted for treatment by the open-tank process. Since the treatments can be conducted with comparatively simple and inexpensive apparatus, it seems certain that the pine pole with creosoted butt will replace the cedar pole in many localities, as soon as its advantages are more commonly recognized.

The Advantage of Roofing Tile

THE manufacture of roofing tile in the United States has not advanced as rapidly as the importance of the industry, or its possibilities, would seem to warrant. It is the American idea to improve upon everything European, and yet in the matter of roofing construction we are centuries behind our foreign rivals. We are usually not satisfied with anything except the best; nevertheless, we continue to cover our buildings with wood, slate, tin, iron or other materials, any of which, at their best, only offer temporary protection and are not commensurate with the character of the buildings themselves.

It must make an American builder somewhat ashamed, when on a trip through Germany, for example, to note the general use of clay tiles for roof covering and to learn that many of these roofs have remained undisturbed for centuries, and that they are made to withstand the attacks of time and weather throughout the life of the buildings themselves; and then to reflect upon the thousands of fine structures throughout the United States whose roof coverings are little more than makeshifts, constantly subject to replacement and repair.

A good building is worthy of a good roof, and a good roof must embody utility, durability, beauty and harmony of architectural effect. These merits and many others are combined in tile roofing, which is as superior to slate as slate is superior to shingle. Clay is the oldest form of roofing material known and ranks today as the best, most beautiful and most enduring of coverings for the habitation of man.

The superiority of clay tiling over slate for roof covering is manifest. There is no question as to its durability, as has been proven by the test of centuries. Clay tiling is absolutely fireproof, whereas it is well konwn that a slate roofing on a burning building becomes quickly super-heated and the draft of a fire causes the slates to break away and fly in every direction, being a menace to all surrounding buildings. Furthermore, clay tiling is a nonconductor of electricity and of heat and cold. There is no record of a building covered with roofing tile having been struck by a lightning bolt.

There are possibilities in the use of roofing tile for architectural effect, in color, warmth and effectiveness, that cannot possibly be produced by slate. In mechanical application roofing tile also possesses many advantages over slate, and on a properly constructed roof should cost less to lay. It is impractical to patch a slate roof satisfactorily; whereas it is an exceedingly easy matter to replace a broken clay tile. Slate roofs rattle in the wind, a fault of which tile roofing could never be accused.

Considering the fact that material suitable for the manufacture of roofing tile can be found in almost every state in the Union, it is somewhat surprising that the industry has not more rapidly developed. If clayworkers throughout the country had given the possibilities of roofing tile the consideration that it merits, today its manufacture would be so general that its market-price would be below that of slate, which in time would cease to be a competitor because of the cost of transportation, usually from distant points. The principal reason for the retarded progress of this industry appears to be the lack of knowledge among the American people as to the beauty, durability and merits of tile roofing. There is a natural disinclination among builders and roofers to undertake new methods in roofing construction. They are inclined to follow the policy of "letting well enough alone," on the theory that if "the man who pays" is satisfied with slate or other roofing, there is no reason why they

should encourage him to use something else, no matter how superior that something else might be. Once the American people have awakened to the advantages of tile roofing there will be such a demand for this material that the builders and the clayworkers will soon get into line and satisfy that demand.

The clayworkers are themselves largely to blame for the slowness of the introduction of tile roofing in this country. They fear to undertake the preliminary experimenting and acquisition of knowledge that will enable them to produce a satisfactory product. They are inclined to wait and let someone else do the experimenting, with the result that the pioneers of the industry are few and scattered. Once they have become convinced of the large profits to be made in this field, roofing tile manufacture will be given an impetus characteristic of American push and progressiveness.

The architects are also somewhat to blame for the slow development of the industry. While one and all acknowledge the superior merits of tile roofing, they have a tendency to recommend it only for more elaborate and costly construction and allow their esthetic ideas to dominate practicality, with the result that their demands for expensive designs in shape and color are such as to require most costly execution of their orders by tilemakers and much special machinery and hand labor. Tilemaking should be more thoroughly standardized, so that roofing tile can have a regular market value, for specific grades and sizes, the same as brick or slate.

In Europe, for centuries, tile has been made by hand. It is largely a local industry and the making of roofing tile is as common an occupation as the making of building brick in this country. There is no reason why, with modern machinery and American ideas, the industry should not become second in importance in this country to the making of brick. Many brick plants, now operating at small profit because of competition, might easily be showing large profits in supplying the increasing demand for roofing tile.

Material suitable for the manufacture of tile roofing is so plentiful in this country and covers such a wide range, that almost any section of the country can produce one or another grade of roofing tile. While clay is the most common material, some of the highest grades in this country are now manufactured from shale with great success. Upon the character of the material depends the process of manufacture. The revolving power press is most often used with success. Speaking in a general way, a clay suitable for roofing tile must be one that will thoroughly vitrify, retain its shape without warping, and show a clear, unfading color. A tile sufficiently non-porous to answer all practical purposes and fully equal to the European tile, can be produced in an ordinary brick kiln if proper skill is applied in the burning.

While there will doubtless continue to be more or less demand upon the part of the architects for tile of special designs, yet the profitable roofing tile plant of the future will be one which will adopt standard sizes and shapes and conduct its operations along the lines which make other business enterprises successful; i. e., the largest possible production of standard sizes at the smallest possible cost.

The profits of a properly conducted roofing tile plant are unquestioned. An authority on the subject states that a cubic yard of clay should produce 1,000 shingle tile of standard size, and on this basis a 2½-acre clay bank 30 feet in depth would produce 100,000,000 of such tile. If these figures are correct and a price of $8.00 per square could be obtained, if would be possible to produce $3,000,000 of revenue from such a clay bank. While this possibility is probably overestimated, yet it is evident that at $8.00 or $10.00 per square for roofing tile any clay mine of proper material can be made to produce much



Concordia Club, San Francisco, Cal.
Lansburgh & Joseph, Architects.

larger profits when turned into roofing tile than if used for the manufacture of brick.

In the future of the roofing tile industry the architect and builder must work hand in hand with the clayworker. It must be understood that the construction of the roof bears an important relation to the use of tile. Roofing tile is suitable for the covering of either brick or frame buildings, it being a simple matter to provide such construction as will be most available for roofing tile and of sufficient strength for its increased weight. It is probable that future construction will provide for double roofing, the tile being laid loosely to provide against expansion and contraction, its principal function being to form a serviceable and lasting protection against the weather.—Brick.

* * *

There's a Difference

Barney Moloy and Mike Carey were mixing mortar.

"Barney," Mike asked, leaning on his shovel, "what is the difference between 'satisfied' and 'content'?"

"The difference? Sure there's none," answered Barney. "If you're satisfied you're content, and if you're content you're satisfied."

"That was my opinion, too, Barney, me boy, up to now, but it struck me sudden like as I turned that last spadeful that I am satisfied all right that Molly Carey is my wife, but I am jolly well sure I'm not content."

Reason for Waterproofing Concrete

IN THE many forms of construction work to which concrete is so admirably adapted, its use brings with it one inherent fault—a fault for which remedies have long been sought, but which until recently have not been found in a practical form suited to all the many needs of construction work. This striking fault of concrete work is its great thirst for water, a fault which varies in its gravity according to the nature of the structure, frequently being the cause of extremely serious difficulty. Of all the opposing forces which constructors have had to combat from time immemorial, none has exceeded in its power for evil the unwelcome intrusion of water, and materials which in their nature favor such intrusion must suffer in value to the extent of such permeability or absorptive power.

The fact that ordinary concrete is very porous and permeable has been one of the leading checks in its rapid development. Volumes have been written on how the ingredients might be mixed to produce a watertight concrete, but we might as well seek to solve the problem of perpetual motion as to try to mix cement, sand and stone so as not to absorb water, says Myron H. Lewis, C. E., in a recent issue of Waterproofing. All the experiments that have been made and all the papers that have been written have only served to emphasize the fact that ordinary concrete is porous, and when dry will drink in water with avidity. And why should it not do so? Can ever-changing ingredients be so proportioned that every minute void in the hardened mass is filled?—so that the concrete becomes a solid, impervious body? No; in the act of mixing, enough air clings to the materials to render the mass full of innumerable minute blow holes; minute to us but not so to the still finer, freely moving molecules of water, which look for an opportunity to move and do so, if the movement is in the slightest degree possible. If we could examine a section of concrete under a powerful miscroscope, it would appear to us like an immense sieve through which fine particles of water flow without hindrance. We have seen water rise up through concrete walls for many feet, and it will rise until the weight of the water absorbed is equal to the attracting force.

We have often heard the statement made that concrete is water-tight, and frequently it comes from those who should know better. It is often stated that if concrete is mixed rich, and mixed wet, impermeability can be secured. Both of these statements are against the very logic of things. Mixing rich may impose some greater barriers to the passage of water; mixing wet may minimize the formation of blowholes by displacing much of the extrained air, but neither mixing rich nor mixing wet destroys the "capillary positive" property of the concrete mass. Its absorptive capacity may have been decreased, but its attraction for moisture has not been eliminated; thus the water-tightness secured by rich and wet mixtures, however, theoretically correct the proportions might be, is one of degree only, a degree sometimes approaching ideal but never reaching it. We cannot expect that a mixture made of cement and stone, each of which is in itself "capillary positive" or water attracting, can become absolutely proof against the passage of water by the mere act of mixing, unless, indeed, the operation had produced some phenomenal change in the very nature of the constituent materials. A mixture may be produced which is sufficiently close-grained to prevent the free transmission of water, prevent it sufficiently, in fact, to be all that is required in many forms of construction work. But where water absorption, besides penetration, is to be prevented, no degree of mixing, no richness of mixture, will altogether answer the purpose; and yet in

many of the forms in which concrete enters our modern buildings, it is resistance to water absorption that is required. Not merely water-tightness in the ordinary sense of the word, but resistance to the ceaseless endeavors of atmospheric moisture to find its way by capillarity through porous bodies. Some counteracting influence to this tendency of ordinary concrete to take up water by capillarity, is, therefore, what is required particularly in superstructural work.

It is true that concrete exposed to the free passage of water becomes after a time so clogged up by the fine silt present in the water that the permeability is greatly reduced; and Hagloch states that concrete block buildings exposed to the weather become water-tight in from three to twelve years, a fact which we must likewise ascribe to the clogging of the surface of the blocks by atmosphere dust deposited by rain, and which remains after evaporation.

Modern engineering or architectural practice should certainly not sanction a practice of waiting for the erratic and uncertain hand of time to secure water-tightness in concrete structures, and in the meantime to incur the annoying consequences that always accompany damp and leaky structures; and yet this is what is being done by those who refuse to realize the importance of water-tightness in concrete work, or, while realizing it, are willing, through motives of false economy, to gamble with the future—nearly always at their loss.

The subject of waterproofing concrete could not be justly treated without some mention of the difficulties to be apprehended by the failure to obtain water-tightness; difficulties which would seem to be obvious, but which, as we have already said, are so often lost sight of.

Concrete blocks are usually made very porous, and have an intense affinity for water. Buildings therefore built of untreated blocks are damp, cheerless and cold, and bring with them the discomforts and dangers to health that usually accompany damp buildings. Perhaps the only exception is the independent two-wall system with unbroken air spaces throughout. Plaster can never be safely applied upon their inner surface without furring and lathing. Furthermore, the face of the blocks are soon disfigured by the deposit of soluble salts of efflorescence washed out of the cement. Some method of protecting the interior plaster from destruction by dampness becomes a necessity, otherwise the structure, instead of being a pleasure to the owner, becomes an eyesore. In addition to the unsanitary condition and the accompanying disfigurement, there is also the question of durability to consider. Any material that absorbs large quantities of water is subject to enormous strains when freezing occurs, and is liable to be destroyed in the course of years.

In reinforced concrete work, particularly in the superstructure of buildings, all the above objectionable conditions resulting from lack of water-tightness apply equally, and in addition we have the danger of corrosion of the embedded metal. Ample experience seems to indicate that metal thoroughly encased in concrete is protected from corrosion by the latter, provided that water in sufficient quantity cannot work its way to the metal and bring corrosion. Concrete work, however, is subject to checking and cracking from a multitude of uncontrollable causes, and should through any such means rusting be made possible, its progress cannot very well be checked. Rusting, which is the conversion of metal into its oxide, is accompanied by expansion, which produces enormous strains in the encasing material, strains akin to that produced by water in freezing.

The Effect of Air and Moisture Upon Steel Reinforcement

THE increased use of reinforced concrete in every description of constructural work lends interest to a series of tests which have just been carried out in Germany with a view to ascertaining whether air and moisture entering through the ordinary tension cracks that cannot be avoided will cause rusting of the steel reinforcement. The results tend to show that when the steel reinforcement has not been stressed to beyond its elastic limit the cracks formed in the concrete are insufficient to cause rusting. For carrying out the tests, beams 6 feet 3 inches by 8 feet 6 inches in cross-section and about 59 inches long, with the various kinds of reinforcement in general use, were prepared. In each case the steel was situated 1¼ inches above the bottom of the beams and formed from 1.03 to 1.31 per cent of the area above the center line of the steel. The concrete was mixed in 1 : 2 : 4 ratio, and 10.1 per cent of water was added. It was found that this amount was sufficient to give a quite plastic mass. The forms were not removed until 24 hours had elapsed. For three months the beams were then stored, some in the open air and some in wet sand, and water was sprinkled over them every day. During the next three months load tests were made on the beams with a view to finding the various physical properties of reinforced concrete beams—viz., first point of cracking, stress in concrete, stress in steel and untimate strength. Of the total of 58 beams made, 26 were broken during the tests. The remaining beams underwent a rapid rusting test under load, which was usually about the same as that to which the beam had been previously subjected. This load varied from considerably below up to the elastic limit. The gear consisted of levers for applying a fixed load to the beam at two points, and a mixture of carbon dioxide, oxygen and water vapor was passed through a sheet iron casing fixed round the middle third of the beam. In the greater number of cases the beams were kept in the rusting atmosphere from 7 a. m. to 4 p. m. for three consecutive days. The concrete below the steel was then chipped off, and the steel examined. In 27 cases no rusting at all was observed. All these beams had been subjected to loads causing stresses in the steel varying from 18,000 pounds to 35,000 pounds per square inch. Where the steel had been stressed from 35,000 pounds to 44,000 pounds, rusting was found to have taken place. The cement makers state that the composition of the cement used in the tests was as follows: Silica, 21.86 per cent; alumnia and iron oxide, 10.3 per cent; lime, 62.5 per cent; magnesia, 1.67 per cent; sulphuric acid, 1.69 per cent. On ignition it was found to lose 1.32 per cent, and the specific gravity was 311.45.

* * *

Surfacing Concrete

The most common defects in the finished surface of concrete masonry are discoloration, scaling and hair cracks. Discoloration may be due to the use of different brands of cement in the same wall, to a lack of uniform color of the sand, to the concrete being non-homogeneous in mixture, or to the use of neat cement or cement mortar paints. Scaling is due to the plastering or painting of the wall with a rich or neat mixture. The fret-work of fine cracks is due to the common practice of using a cement mortar facing against the face forms. The appearance of these cracks is



St. Luke's Church, San Francisco
Ben G. McDougall, Architect

readily explained by the fact that the amount of shrinkage of concrete in setting is less than that of cement mortar.

The following method of surfacing concrete should eliminate all of these defects and give a smooth and durable finish. Prepare a smooth and tight form, oiled, and in accordance with the usual instructions. While laying the concrete pry back the body mass with a flat-bladed tool. This is not for the purpose of forcing the mortar to the front as is sometimes supposed, but to prevent the arching of the stones against the forms and the production of voids in the surface. A convenient tool for this purpose is made by welding a piece of steel plate to a rod. After the concrete has attained a consistency which will allow of the removal of the face form, but when it is still green and tender, go over it with a kalsomine brush and plain water until the marks of the forms have been entirely removed. When the masonry has hardened the surface may be rubbed smooth with a carborundum brick or a briquette of cement mortar. It is important that the concrete be kept damp during the process of setting; otherwise the surface may dry out and leave insufficient water for crystallization. This may be done by covering the masonry with a wet tarpaulin and keeping it damp.

* * *

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Los Angeles Architects Honored.

Architects Parkinson and Bergstrom of Los Angeles have been commissioned by the directors of the Utah Hotel Company of Salt Lake City to prepare plans and supervise the construction of a magnificent hotel building. It will be ten stories and basement and cover a ground area of 165x195 feet. It will contain 405 guest rooms, exclusive of the lobbies, halls, parlors, offices, kitchen, dining-room, etc. On the ground floor will be a splendid lobby with entrances from South Temple and Main streets. From the lobby will run a grand corridor a distance of 135 feet to the dining-room, which will be 54x90 feet in size. Three hundred rooms will have private baths. The structure will be of steel and the outside is to be finished in terra cotta

and brick on the upper floors and stone on the lower stories.

As the building is to be completed in fourteen months, it will be necessary that work commence at once. The contract for the excavating has been let, and is now being prosecuted. The contract for the skeleton steel frame has been awarded to the American Bridge Company of New York. The architects have established a branch office in the Herald Building, Salt Lake City with Mr. J. H. Hill, their engineer in charge. Mr. Norris, their Oakland representative, will also be on the work. The estimated cost of the building is $1,-200,000.

Wedding Bells.

Architect Fowler Mallett and Miss Maud D. Sanderson, daughter of Judge A. A. Sanderson of San Francisco, were married by Rev. Edward Morgan at St. Luke's Church, June 16th. They will reside at Hayward.

Architect Willaim Binder of San Jose and Miss Florence Latta, were married in the Garden City on June 12th. They are residing in Mr. Binder's attractive English house in the fashionable Neglee Park, San Jose.

Seattle Exposition a Wonder.

When Mr. Charles S. Fee, passenger traffic manager of the Southern Pacific Company, arrived in Seattle soon after the opening of the Exposition, he telegraphed General Passenger Agent James Horsburgh Jr. as follows:

"Twenty Southern Pacific passenger agents from all parts of the Pacific system to-day visited the Alaska-Yukon-Pacific Exposition, and they were unanimous in their praises of all that they saw. Its a wonder, unique among all similar expositions. It tells a big story to the people of all this nation, a true story of what there is to be found today in Alaska and the great Northwest. Every building was ready on opening day, June 1st, and flags were flying and bands playing just as they will continue until the closing of the Exposition on October 15th. The Exposition as it stands represents an investment of about ten million dollars. The Forestry building, made of monster timber from the forests of Washington, is the most remarkable of all the buildings while the Alaska exhibit tells in detail of the country that has yielded two hundred and ninety-six million dollars' worth of product in the past thirty years. The buildings and grounds are remarkably well arranged so that one can get about easily without weariness and all details are most artistic in their conception."

San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter of the American Institute of Architects was held in the green room of the Hotel St. Francis June 17th. After the usual dinner the meeting was called to order by President Pissis. The attendance was twenty-two.

Messrs. John Davis Hatch and Walter D. Reed were elected to membership in the chapter.

The chapter ratified the action of its committee which had suggested to the Board of Supervisors certain changes in the program for the proposed City Hall competition.

A committee was appointed by the chair to draft a suitable code of ethics for the professional conduct of the members of the chapter.

The acquisition of the proposed Civic Center by the city was indorsed by the chapter.

Mr. David Farquharson, who had recently been elected to honorary membership in the chapter, was present at the meeting, and in responding to the remarks of Mr. Schulze, who stated the pleasure of the chapter at the honor of his presence, spoke interestingly of his early experience in the profession and mentioned the fact that he was the sole survivor of the first architectural society in San Francisco, which was organized forty-seven years ago and consisted of seven members. He congratulated the present generation of architects on the facilities with which all class of building materials could be utilized, as compared with the meager supply in earlier days. Mr. Farquharson also thought the architecture of the rebuilt San Francisco was far superior to that which was destroyed by the fire.

San Francisco, Premier City of the Coast

The regular monthly meeting of the Engineers and Architects' Association of Southern California was held June 18th at Hollenbeck Cafe, President A. A. Fries presiding. The attendance was larger than usual, side tables being required to care for the overflow of guests at dinner who were unable to find seats at the long table.

Mr. Henry Dockweiler of San Francisco, an early member of the association, was present. Mr. Dockweiler was called upon by President Fries to tell of the San Francisco of to-day. Mr. Dockweiler said that "San Francisco is experiencing a dull period. The men who have money won't let go of it. Big enterprises projected immediately after the fire have been set aside. But from its position geographically San Francisco appears to me to be bound to become the premier city of the coast. It is always assured of cheap water transportation.

"When the Panama canal is built, either Los Angeles or San Francisco, or both—one for some kinds of freight and the other for another—will be the stopping place for all the ships that pass through the canal. There is no reason why this should not be the richest state in the Union."

Mr. Dockweiler called attention to the fact that "every commercial enterprise of to-day has an engineer at its head; the future of engineering is very hopeful."

At the close of his ten minutes' instructive and entertaining remarks President Fries presented him with a "Free Harbor" button from his own lapel, saying: "Mr. Dockweiler, speaking of harbors, we are working for a harbor ourselves."

Hongkong Architects

Hongkong is one of the architectural centers of the Orient, and professional practice there under British rule is generally carefully guarded. It is the architectural apex of the triangle formed by it, Canton and Macao; the first two cities are always busy with construction work and offer splendid fields for building materials.

The following list of architects is published for the benefit of dealers and manufacturers looking to that territory for business; the starred names are of the men in colonial service, and in no instance is a street address required:

Austin, Anthony Roy.
Bird, Henry William
Bird, Lennox Godfrey.
*Boulton, James Fettes
Bryer, Alfred
*Chatham, William, C. M. G.
Denison, Albert
*Fisher, Henry George Corral
*Gale, Charles Henry
Gibbs, Lawrence
Griffin, Albert Edwin
Harker, Bernard Brotherton
Hazeland, Ernest Manning
Hewitt, Alfred Herbert
*Hollingsworth, Arnold Hackney
Hooper, Augustus Shelton
*Jones, Patrick Nicholas Hill
Lemm, John
McCubbin, John
Ough, Arthur Henry
*Perkins, Thomas Luff
Ram, Edward Albert.
Raven, Arthur Robert Fenton
Rose, Louis Augustus
Samy, Arthur Poonoo
Sayer, George John Budds
Thomas, Christopher Boswood
*Tooker, Hugh Pollock
Turner, Arthur
Warren, Charles
Weaser, William Lionel Wreford
Wong, A. Cheong.

Los Angeles Architectural Club Meets.

A small attendance, but a group of members determined to make a successful, active working organization of the reorganized Los Angeles Architectural Club, gathered at the old club rooms, 718 South Spring street, with President A. F. Rosenheim in the chair. The secretary reported the membership now totals 58, with nine applicants, all of whom were voted to full or associate membership. Minor changes in the constitution and by-laws were read and approved and the club voted to have 500 copies printed. The agreement of the directors with M. A. Vinson to affiliate with the Architectural League of the Pacific Coast, and to appoint Mr. Vinson business manager for the architectural exhibition to be held in Los Angeles for two weeks in November, was read. This exhibition will be of work by Eastern architects as well as local drawings and sketches.

The house committee reported progress in the search for new quarters. A large portion of the fourteenth floor of the Union Trust building is under consideration and this location, if satisfactory arrangements can be made, met with the approval of the members present.

Bungal—Ode.

There's a jingle in the jungle,
  Midst the gum trees and the pine;
He is mangling the tangle
  Of the undergrowth and vine,
And his blood is all a tingle
  At the sound of blow on blow,
As he counts each single shingle
  On his bosky bungalow.

There's a jingle in the jungle;
  He is counting every nail;
For he says, " 'Twill be a haven
  Where the world will not assail,
And I dream of every ingle
  Where I'll linger at my ease,
Nought to set my nerves a jingle,
  I may 'bungle' as I please."

Oh, a true word oft is spoken,
  When a man is half in jest;
At the mention of a bungle,
  Even though he does his best.
There'll be trouble in that jungle
  Where he builds to seek his health;
With his bungalow he'll bungle,
FOR HE'S BUILDING IT HIMSELF!

—Exchange.

New San Jose Bank Building.

The Lewis A. Hicks Company has been given the contract for the erection of a nine-story class A building for the First National Bank of San Jose, from plans by Architect L. B. Dutton of San Francisco. The building will cost about $250,000.

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REINFORCED CONCRETE PIPE.

Tests of reinforced concrete water pipe for high-pressure service, which the United States Reclamation Service has been conducting at Hermiston, Oregon, have proved so satisfactory that the Government will install a two-mile pipe line of reinforced concrete in one of its irrigation projects.

The tests were made under the direction of Supervising Engineer Ernest G. Hopson of the Portland office of the Reclamation Service, and the experiments tend to prove that reinforced concrete is the cheapest as well as the most satisfactory kind of pipe for high-pressure water use. An exchange says:

> The Government Reclamation Service is about to build two miles of high-pressure main for the Umatilla irrigation project, and it was desired to utilize reinforced concrete for this work if tests showed it to be satisfactory. Several sections of pipe were constructed with a four-foot channel and a shell three inches thick. This pipe was subjected to a pressure varying from sixty to seventy pounds per square inch.
>
> The result of the tests showed conclusively, according to Mr. Hopson, that reinforced concrete is suitable for the purpose of the Government, and it has been decided to build the entire main of that material. The advantages of the concrete pipe, according to the engineers, are that it is about one-half as expensive as steel or iron pipe, just as permanent, and that, in fact, its cost is only a little more than that of wooden pipe.

On another page in this number of The Architect and Engineer we publish extracts of a report of the Denver Improvement Association, which, after a thorough investigation, has reported favorably for reinforced concrete sewer pipe in preference to clay. The committee finds that to make clay pipe that is perfectly true in form, or at the joints is practically impossible; that clay pipe is extremely brittle, and will not stand even very light jars; that if it becomes soaked with water and freezes, it disintegrates. The reports of the various city engineers showed that no ill effects had ever been shown in well-formed cement pipe from the effect of acid or alkali in ordinary soil or sewerage; they found that concrete pipe that had been exposed to the alternate wetting and drying at salt water was not affected by the strong alkalies in same.

Several miles of sewer pipe are about to be laid in San Francisco, and the municipal authorities will do well to follow the example set by the city of Denver, and investigate thoroughly the various kinds of pipe before awarding any contracts.

FRANCE IS GRATEFUL.

Late copies of the French journals comment in glowing terms upon the ceremonies attending the recent transfer of L'Enfant's remains to the National Cemetery at Arlington, at which President Taft, Ambassador Jusserand and other dignitaries were present. They look upon that graceful act of the American nation as a great mark of friendship for France and an added tie between the two countries.

La Construction Moderne, the leading architectural journal of that country, says editorially:

"... L'Enfant played a most important role in the establishment of Washington as the young nation's capital. To him is due its beautiful plan and the sightly locations of its early buildings. But later on, there as elsewhere, the artistic and harmonious scheme was abandoned and the state buildings were located at haphazard, as best suited the needs of the moment or private interests or greed. Then in 1896 Architect Fitzpatrick of that city inaugurated a vigorous campaign to persuade the nation that it was time to revive the artistic spirit and to revert to the original plan of L'Enfant. The idea was well received and, as we noted at the time, the President appointing an art commission to care for the systematic grouping of buildings and the control of parks and improvements. There has been a decided renaissance not only in that city but in the entire country in the direction of the City Beautiful.

"In France few of us remember that L'Enfant rendered such signal artistic services to the young republic after having fought its battles beside our Lafayette under the orders of Washington, the great general and President who has been the model of all succeeding Presidents in every republic. The Americans, it would appear, know better than we how to preserve and honor the souvenirs of the past. They possess in a high degree those practical qualities so absolutely indispensable for national progress, but, we note, they possess equally the higher idealism and sentiment that make them grateful to all who have helped them in their adolescence, a beautiful quality. Since it is France and a Frenchman that were honored in this recent touching ceremony it is but meet and just that we do not let the occasion pass without showing our appreciation and extending to them the hand of fellowship and good will. . . ."

SHOULD VISIT THE EXPOSITION.

What the Pacific Coast region can do has never been better told than by the Alaska-Yukon-Pacific Exposition, now in progress at Seattle. One hundred Californians, under the auspices of The California Promotion Committee, and other commercial organizations in California, went to the Exposition in a magnificent special train, and they have returned filled with the vast importance of this exposition as an educational factor in the development and upbuilding of the Coast.

What these hundred Californians have seen should be seen by every Californian. The exhibits equal those of any exposition ever held, and in addition to having most of the things that have been seen in other expositions there are many that have never been featured before. Every one who visits this exposition cannot fail to return to his home with a higher sentiment of loyalty to his country and a feeling of pride in his own State.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

Modern Ideas in Plumbing, and Their Advantages.

APPARENTLY the efforts of plumbers are at last about to be recognized as factors in bringing about the necessary improvements in plumbing systems. At recent meetings of medical men these efforts have been commended, as well as what had been done along the lines of improved sanitation. One result noted by the medical profession is a marked general improvement in public health. If the public would recognize this fact, and in place of abusing the plumbers at every opportunity, assist them by exhibiting good feeling toward them, it would go some distance toward effecting an improvement.

At the present time the laymen, who in many cases have been posted by the plumber regarding the requirements of a perfect plumbing system, will be listened to in preference to the man who has given the subject a life study. This should not be the case, for there are men in the business to-day who are not only intelligent, but have given the subject, i. e., the principles of sanitation, a good deal of thought and study.

It may not be out of place to give a short description of the many improvements that have been made in the principles of sanitation, mainly through the efforts of the manufacturer and the plumber. In the first place, it is interesting to inquire the meaning of the word "plumber." Historically we find he is one who works in lead. The Chinese used lead long before the Christian era, so that we must recognize the Oriental as the pioneer of the plumbing trade. This may not be pleasant news to the plumber of to-day, but nevertheless it is true. The Chinese were not the only ones, however, to use lead in early days, for we find that Archimedes, a Greek philosopher who lived 200 years before the Christian era, made use of lead pipe. It is stated also in the Bible that "lead is a lasting metal for letters," and that David used leaden pipes. These references were to lead workers, whom we now call plumbers; so that we can consider Archimedes as the first plumber and give the birth date of the trade as 200 years B. C., or, bringing it up to the present time, 2109 years ago. Plumbing, therefore, has time; it fades into insignificance when compared with the age of lead using by the Chinese, which commenced about 5000 years ago.

History is silent with regard to plumbing system, and especially so as to fixtures, until the year 1775, when a patent was taken out in England by Cummings for a water closet. This closet was worked by a slide valve. Two years later Prosser patented a closet very similar to our old Demerset with float valves to regulate the water. Then in 1778 Bramah patented a closet having two valves, one to regulate the water, the other to take it away. This closet had a ground-in brass outlet four inches in diameter, a wooden frame and lead-lined

trunk. Next came Undeshay, who made the bottom valve close on a rubber seat. This invention must have been about the year 1840, as that was the year in which India rubber was first vulcanized and made suitable for the work. Very little improvement was made in this fixture until the old pan closet, with its lead trap, cast-iron trunk and porcelain bowl, came in; but this, like all the former closets, was not sanitary. There were large unventilated spaces, the air from which could freely escape into the apartment through the opening in the trunk.

Then came the all-porcelain bowl and trap combined, in all shapes and sizes. This line of invention has had a lasting effect. The closet of to-day, with a three-inch outlet, separate flush valve assuring every part being thoroughly washed out when operated, if properly installed under modern methods and kept clean, is a fixture which, when we adopt the all-porcelain seat in place of the wooden, is not only sanitary, but of pleasing design.

The wash basin has been steadily improving. The old days of boxed-in basins have passed and gone, the shape has also been changed, and we now have the clean white enamel and the all white porcelain in a multitude of styles, many of which are very beautiful in design and finish.

Urinal construction has made rapid strides in the last few years, though not before it was needed. The fixture is one of the most difficult to arrange in such a manner that it will be self-cleaning. This is one of the most essential features of a urinal.

We have come from the old lead-lined kitchen sink to the sanitary cast-iron enameled, and to the all-porcelain sink. The greatest step in the right direction was taken when the boxed-in arrangement around the old sink was disposed of, and with it went the store-hole for everything from the kitchen. What a contrast between this arrangement and the present sink and drainer, supported on brackets of the same material!

The materials used for soil, waste and drain pipes have changed greatly. Although they are not perfect yet, the improvement has been very great. We have come from the sheet, galvanized and lead soil pipes to the cast-iron hub and spigot pipe, which is generally used to-day. This style of pipe should not, however, be used in any building over ninety feet high. Buildings over this height should have wrought-iron drainage systems. The best features of this system of piping are the greater and more uniform strength and permanence of the joints and the greater flexibility of the pipe and system as a whole.

From the wooden box drain we have come to the tile and cast-iron. In some of our larger buildings, where the extra cost of installation need not be considered, wrought-iron screw-jointed pipe is used. I hope the time will come when this material will be the only one allowed inside any building. I consider the screw joint the only safe joint, where the changes in the temperature are frequent.

A great deal might be said about modern ideas of installing plumbing pipe and fixtures, and about our back venting and local ventilation systems for bathrooms and lavatories. In olden times one trap for water-closet basin and bath, and one waste connection to soil pipe for all three fixtures, was all that was considered necessary. Now we have a separate trap for each fixture.

Sanitation in modern buildings is given far more consideration to-day than formerly. Particularly is this seen in the wonderful improvement in plumbing with regard to draining systems, the water supply and the fixtures. Formerly plumbing fixtures were hidden away in poorly ventilated, poorly lighted, out-of-the-way places, and used only as necessities. They now occupy a prominent place in the house and have become a luxury as well as a necessity.

Ask an experienced plumber of to-day what are the essentials of a perfect system of plumbing, and invariably he will give the following answer:

First — An adequate supply of water to flush the various fixtures.

Second—Fixtures that are of enameled iron or porcelain, set open, in well-lighted and ventilated rooms.

Third—Waste pipes large enough to carry off all waste material, yet not too large to be self-cleaning.

Fourth—A system of ventilation so arranged that it will ventilate every portion of the drainage system properly.

Fifth—A quality of piping for soil pipe and drains that will not corrode nor be affected by sudden changes in temperature.

Sixth—A thorough system of testing and inspection by practical men, not only when the work is finished, but during the installment of all piping.

The plumber is the man who can save the "doctor's bills" and keep away many diseases from the home, through his skill and knowledge of what good plumbing means. He should be encouraged to do the best of work and to become conversant with the best ideas in the trade as to what is required to improve our present plumbing system, which, greatly improved as it is, can yet be made much more perfect.

Overshooting of Tungsten Lamps.

When tungsten lamps are thrown on to a circuit they take several times their normal current for a short space of time. This excess of current causes the candle power of the lamp to go beyond its rated value until the lamp has attained its normal condition.

It is evident that on an installation of several hundred lamps this excess current would be considerable, especially if the lamps are turned on and off frequently. It is often the case that fuses will be blown on circuits of tungsten lamps when first turned on, even though the fuses are heavy enough to carry the load when the lamps are operating under normal conditions. The excess current can often be detected when a lamp is screwed into a live socket, as a snap can be heard the instant the lamp makes contact, giving evidence of heavy current.

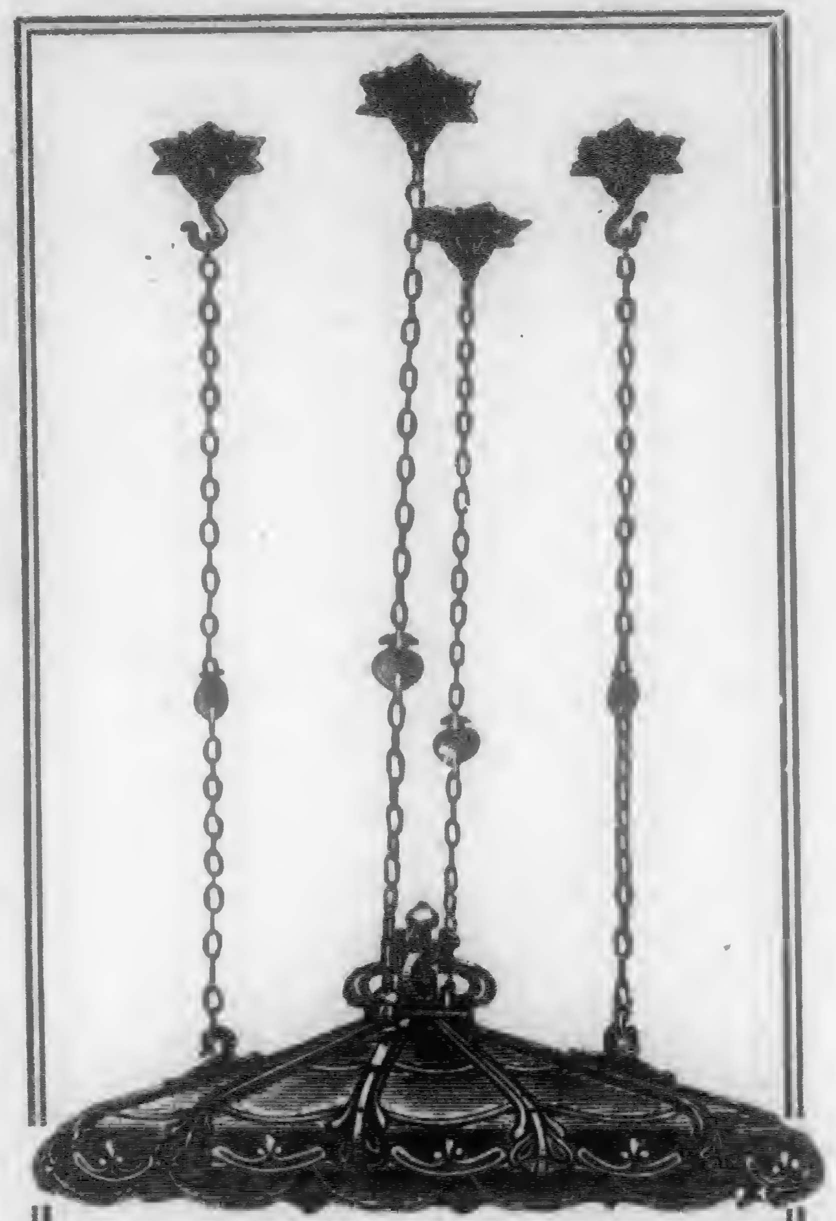
The overshooting is not so noticeable in the case of lamps that are continuously being flashed as in the case of an electric sign, since the current is turned on before the lamps are cold, and before the resistance of the filaments has decreased to the point where heavy currents will be allowed to pass.

Intrinsic brilliancy, when referring to a light source, is understood to mean the candle power per square inch of surface of the light source. In other words, it is the average candle power divided by the surface expressed in square inches.

In the case of a clear tungsten lamp it is the average candle power or mean spherical candle power divided by the area of the surface of the filament. Since the area of the filament of the tungsten lamp is only a fraction of an inch, the intrinsic brilliancy is very high. If the lamp be frosted, the area is no longer the surface of the filament, but of the entire bulb, and hence the brilliancy is decreased.

New Uses for Outdoor Lighting.

Modern light sources have turned night into day for almost every purpose of labor or recreation. Construction work of all kinds is now carried on where desirable, quite as rapidly by night as by day. The electric light and acetylene gas have made this possible and practical. The electric street railway and electric street lighting have given rise to a new amusement institution which can now be found in almost all cities and towns of any size—the recreation park. The institution, of course, is the direct result of the street car company's fondness for gathering coins; every traction company is a confirmed numismatist.



But as the street car is a thoroughly useful and convenient thing, as is shown by the impatience of the people when it is blocked for even a half-hour, so the summer recreation park is a decided addition to the attractions of a city. In the nature of things it is located in the suburbs and in some spot as much favored by natural beauty as can be found. Reaching it necessitates a ride of greater or less distance through country or outlying districts, and the park itself, with its brilliant and fantastic lighting and various mechanical pleasures which are so dear to the heart of the American city dweller, combine to afford that relaxation and exhilaration of mind and body which highly contribute to health and happiness.

Justice Brewer of the United States Supreme Court has declared that "golf is not a game, but a disease." If golf is a disease, baseball is contagious and well nigh universally distemper. The present season will see at least two or three ball grounds equipped for night games by means of artificial illumination with electric arc lamps. Chicago, Cincinnati and Pittsburg are all to try it out. There can be little doubt of its success, for there is no practical reason why a ground should not be so brilliantly illuminated as not only to make the game possible in the highest state of the art, but to make it thoroughly visible to and enjoyable by the spectators as well. When this practice becomes general, as it undoubtedly will, the office boy will be spared the grief of so frequently attending his grandmother's funeral during the summer, and the business man who is far too busy to receive an advertising solicitor will not find it necessary to make so many trips to the neighboring city, nor have so many directors' meetings to attend.

But, after all, baseball is as tame as a game of croquet, compared with the strenuous sport of selling suburban real estate in a Western town. The inducements offered to make a "home run" are so many and varied that if one does not fan himself out in the wild attempt to hit the right lot, he is fully entitled to score. At least one Western city intends to compete with night baseball by the real estate game. The lots are to be lighted up at night, not only so that prospective purchasers may find their way thither, but to such a degree that the lots may be fully inspected, and will present a spectacle worth twice the price of admission whether they buy or not.

And so the uses of artificial illumination continue to expand. —Illuminating Engineer.

Noiseless Plumbing in Residences.

A very disagreeable feature of plumbing work in the home is the noise due to the operation of plumbing fixtures. In many residences the operation of the water closet in the bathroom can be heard all over the building. Such noise, however, is unnecessary, and can be avoided by intelligent design of the system and judicious selection of fixtures. Among the many closet combinations carried by the various manufacturers each manufacturer has some one fixture which is less noisy than the rest, and for that reason is more suitable than the other fixtures for residence work. It is well to be acquainted with the various closets of the manufacturers, so that when a noiseless one is wanted it can be specified by catalogue plate and number. But even when the closet is noiseless in operation, noiseless plumbing is not assured unless the supply and waste pipes are likewise proportioned to their several uses. If the supply pipes are too small there will be a disagreeable hissing sound when water is being drawn, not only at closet fixtures but at other points in the building. Further, if the pressure is high, and properly designed faucets or suitable air chambers are not provided, there will be a pounding noise when a faucet is closed, due to water hammer.

These sources of trouble can be eliminated by using slow-closing faucets and large-size supply pipes to the various fixtures.

The noise of water from closet fixtures flowing through the soil pipe can be decreased in volume by using 3-inch soil pipes in the partitions, and the remaining noise can be almost entirely done away with by filling the space around the pipe and between the laths and plaster of the partition with some non-sound-conducting substance. Finally, the partitions around a bathroom should be sound-proofed, and, so far as possible, doors for bathrooms should be used through which but little sound will pass. —Modern Sanitation.

Night Illumination of Real Estate.

The Los Angeles Examiner is responsible for the following:

The King Realty Company, Pacific Electric building, has inaugurated an innovation by arranging to show lots at night, beginning tonight, in Southwest Heights, the property which it has placed upon the market and which is attracting much attention.

More than 1,000 flambeau torches will be used to illuminate the property, and besides serving a very practical purpose, will be spectacular.

Two-thirds of the people of Los Angeles, it is estimated, are busy in the day and cannot go out to see this property, and it is for their benefit that the illumination has been arranged, and will be continued nightly.

Mr. Pike Back From the East.

Edwin B. Pike of the Butte Engineering and Electric Company, and an associate editor of The Architect and Engineer, is back from the East, having combined a two months' business trip with pleasure. While in the East Mr. Pike visited several of the factories of the National Electric Lamp Association, and, according to him, it is quite apparent that the tungsten lamp within a year will be the only commercial lamp on the market. Great strides are being made toward their perfection, and already they are producing a very high candle-power lamp in practically the old sixteen candle-power size.

Praise for Mr. Leland.

The elaborate heating and ventilating system in the new Orpheum Theater, which was described by Architect Lansburgh in the June number of The Architect and Engineer, was designed by William B. Leland, S. B. Some $20,000 was expended in providing a thoroughly up-to-date system, and it can be safely said that the equipment is without a duplicate west of Chicago. The engineering work is a splendid tribute to the professional ability of Mr. Leland.

Big Demand for Pittsburg Boilers.

The Pittsburg Water Heater has had a phenomenal sale in California the past year, due very largely to its aggressive handling by Messrs. Joseph Thieben and J. G. Scott. From a comparatively small patronage the Pittsburg boiler has enjoyed a steady increase of sales until now it is used more than any other high-priced domestic water heater, and architects are specifying it in preference to others. The heater, wherever installed, has given thorough satisfaction doing all that its manufacturers claim for it. Messrs. Thieben and Scott have found it necessary to take larger quarters, and to this end a portion of the three-story building at 667 Mission street, San Francisco, has been leased for a term. Several rooms have been fitted up as a flat and heaters have been installed, with the idea of giving architects and prospective purchasers practical demonstrations. Any person interested in domestic heating is cordially invited to visit the showrooms; or descriptive matter will be mailed free upon request.

By the Way

Some Industrial Information Worth the While

Gets Contract for Big Steel Bridge.

The United Engineering and Construction Company of Portland, Ore., has just been awarded the contract for the erection of a six-span steel lift bridge over the Willamette river, for the city of Portland.

This company, which has only recently been organized, has strong connections and heavy backing. The officers are Drake C. O'Reilly, C. H. Lewis and F. A. Rosenkrans, of Portland, Ore., and A. S. Eldridge of New York. Mr. Eldridge had direct charge for eight years of the construction of the Buffalo and Cleveland breakwater, on Lake Erie, for Hughes Bros. & Bangs, and for several years has been associated with and has had charge of very important work for J. G. White & Co.

Associated with the company as consulting engineers are Mr. Stephen U. Hopkins and Mr. James S. Winters of New York. Mr. Hopkins was for several years with the Pennsylvania Railroad, and for the last eight years has been in charge of construction of some of the most important sections of the New York Subway. Mr. Winters was for some time connected with Eastern bridge companies, and for the last five years has been in charge of important building work for Charles A. Cowen & Co. of New York city.

The new company is organized and equipped to do general contracting, building and engineering work.

An Engineer's Estimation of Milo Ketchum's Work.

"Architect and Engineer," San Francisco—Gentlemen: Return to you herewith "Design of Highway Bridges," by Milo Ketchum. You cannot speak of this volume in too high terms, as it is the best publication I have seen to date. It meets the wants of the practicing engineer in a thorough and practical manner and is a practical book all the way through. Sincerely yours,

JNO. B. LEONARD, C. E.

P. S.—If this book becomes a burden to you at any time, will be glad to house it for you.



BENEDICT BUILDING, SAN FRANCISCO

Righetti & Headman, Architects — Caldwell Company, Contractors

More Than a Mountain of Malthoid.

As soon as the building committee of the Seattle Exposition reached the point of having to decide upon the various materials to be used in the construction of the buildings, there arose a very hotly contested fight over the kind and quality of roofing to be used. Nothing but reliable and well-tried roofing could be considered, owing to the necessity of securing a water-tight roof that would remain so as long as there was any exposition, for a leaky roof would result in spoiling many valuable exhibits and make the management liable for heavy damages.

Some forty-eight samples of roofing were submitted, each claiming to be the best, although many of them were manufactured by the same company and put on the market under different brands. With such a line of samples and presentation of qualities it was up to the exposition to test them out. The tests resulted in the rejection of all but five, and one of them, Malthoid, was adopted as the standard of the specifications.

Malthoid then became, in reality, the roof for all buildings erected under the supervision of the exposition committee. About 10,000 squares were used on the various buildings.

A Beautiful Art Glass Panel.

One of the most elaborate and artistic art glass panels that have gone into store fronts in Los Angeles is that extending across the entire front of C. Christopher's confectionery at 350 Broadway. It is eighteen feet long by five feet deep and worked out in a harmonious and rich color scheme that cannot fail to attract and hold attention from every passer-by. The name Christopher occupies the center of the panel, done in a soft green tint. This pierces the motif of the panel, a cluster of rich crimson roses which forms the nucleus of the entire color scheme. The superb blending of colors and the wide range of tints, in which there is nothing to break the complete harmony, has won for the panel the admiration of all connoisseurs in art glass.

This panel is one of a number of distinctively artistic art glass pieces designed and made by the W. H. Judson Art Glass Company of Los Angeles.

Macadam Treatment in Palo Alto.

Experiments carried on in Palo Alto, under the direction of J. F. Byxbee Jr., city engineer, have resulted in the selection of an asphaltic flux as a macadam coating. This material is the flux that is used there as a softener for asphalt in the manufacture of asphalt pavements. Following are the specifications:

"The refined liquid asphalt must be a stiff residuum of petroleum oil with an asphalt base. It must be free from water and from light oils volatile at less than 250 degrees Fahrenheit. When twenty grams are heated to a temperature of 300 degrees Fahrenheit for five consecutive hours in an uncovered cylindrical dish 3½ centimeters high by 5½ centimeters in diameter, it must not lose more than 5 per cent in weight. It must contain not less than 99 per cent of bitumen soluble in chloroform, and must contain no free carbon."

The material is sprinkled on the surface at about 200 degrees Fahrenheit and brushed out evenly at once, as it cannot be swept after cooling, about three-tenths of a gallon per square yard being used. Enough clean screenings to absorb the surplus is applied, and a tough bituminous mat from one-quarter to one-half an inch in thickness is formed. This covering has been found to protect the macadam from wear, shed water, reduce the dust nuisance, and wear better than anything yet tried.

The bitumen costs about 10 cents per gallon. About one cubic yard of screenings is required for each seventy square yards of coating. The total cost per square yard for the materials and labor is about as follows:

Bitumen	$0.035
Heating, spreading and dressing with screenings (cost of screenings included)	.0125
Sweeping before applying coating	.005
Total	$0.0525

(Continued on page 110.)



View showing contrast of higher court in Pacific Building, San Francisco, veneered with 6 by 3 inch bright white glazed wall tiles and section as it appeared before such treatment.

TRANSFORMING A DINGY LIGHT COURT INTO BRILLIANCY.

THE above cut shows the light court in the Pacific building, San Francisco, before and after veneering the walls with white bright glazed tiles. The dark section shows the original cement finish, while the light section shows the appearance of the walls after the tiles were laid. The tiles are known as Patent Grip Anchor Back Wall Tiles, and they are of bright white glaze, 6x3 inches, and made by the American Encaustic Tiling Company, Ltd., of Zanesville, Ohio. The tiles are specially well suited for a job of this sort on account of their security against coming loose after once having been set, the anchors formed in the tiles, in making, producing a perfect rivet head of cement at each corner of the tile.

There were nearly 20,000 square feet of tile used in this light court, and it was supplied by Mangrum & Otter, Inc., from stock. It would seem that San Francisco dealers carry immense quantities of tile in stock to be able to fill such an order at a moment's notice.

(Continued from page 109.)

The sweeping is done with a horse-drawn sweeper and then by hand. To insure success the surface must be thoroughly clean and dry, well compacted and strong.

The surfacing is practically free from objectionable odors.

A Straight Talk to Contractors.

A CONTRACTOR should be able to know, within reasonable limits, how much a certain amount of work will consume in actual time and labor, writes Warfield Webb in the National Builder. He must understand just how much material will be required for the contract, and be able to purchase the same to the best advantage.

Experience is a practical teacher, but, as it is costly, it is better to learn all possible without it. What a builder learns from experience is dearly paid for. If he blunders, it may be the means of making him lose the contract and others besides, and it may be so costly that he will be many days in recovering from the effects of the same. Forethought, then, is the primary lesson to learn in taking contracts for yourself.

When a contractor has fully mastered the plans of a structure he must be in a position to order the stock as required, being careful to keep the proper amounts and the proper commodities in mind at all times. He should figure on the cost of the excavations, on the cost of the foundations and the primary work, as every moment's time is of value when he has men employed by the hour or day, and he must see that his men are not handicapped in this way from a lack of sufficient material to keep them busy. He must see that they get to the building on time and that they remain there until the hour for quitting. I have noted instances where the men did not appear any too anxious to come early or to work late, and that they did not exert themselves then to any marked degree.

An error in figuring the amount of time or material is always costly, and, more than that, it creates delays and disorders that cost money. The contractor must be the "boss" of the job and allow no one else to give instructions about the work. Others may be older in years and experience, but they should be made to understand that you are fully capable of carrying out your own plans intelligently. If you are not, they will soon find it out and there will be further disagreeable conditions to contend with.

The quality of material should be carefully noted. Inferior stock and careless workmanship are things not calculated to improve the general tone of the work. In ordering material see that you get what is called for, at the proper price, and see also that the same is delivered to you on time. Your own supervision of the work is the best evidence that you are vitally interested, and one that will do much to get you other work. If you are not there much of your time, there will be occasions when your presence will be badly needed and when the lack of it will be costly.

It is the details that go so far toward success in this day of earnest competi-

tion. Noting these is naturally irksome at times, but they are essential, and the man who does not see the necessity of looking after the smaller things will be sure to overlook some of the larger ones, and that means sure and certain failure. First have the knowledge yourself, and then you can impart the same to those under you.

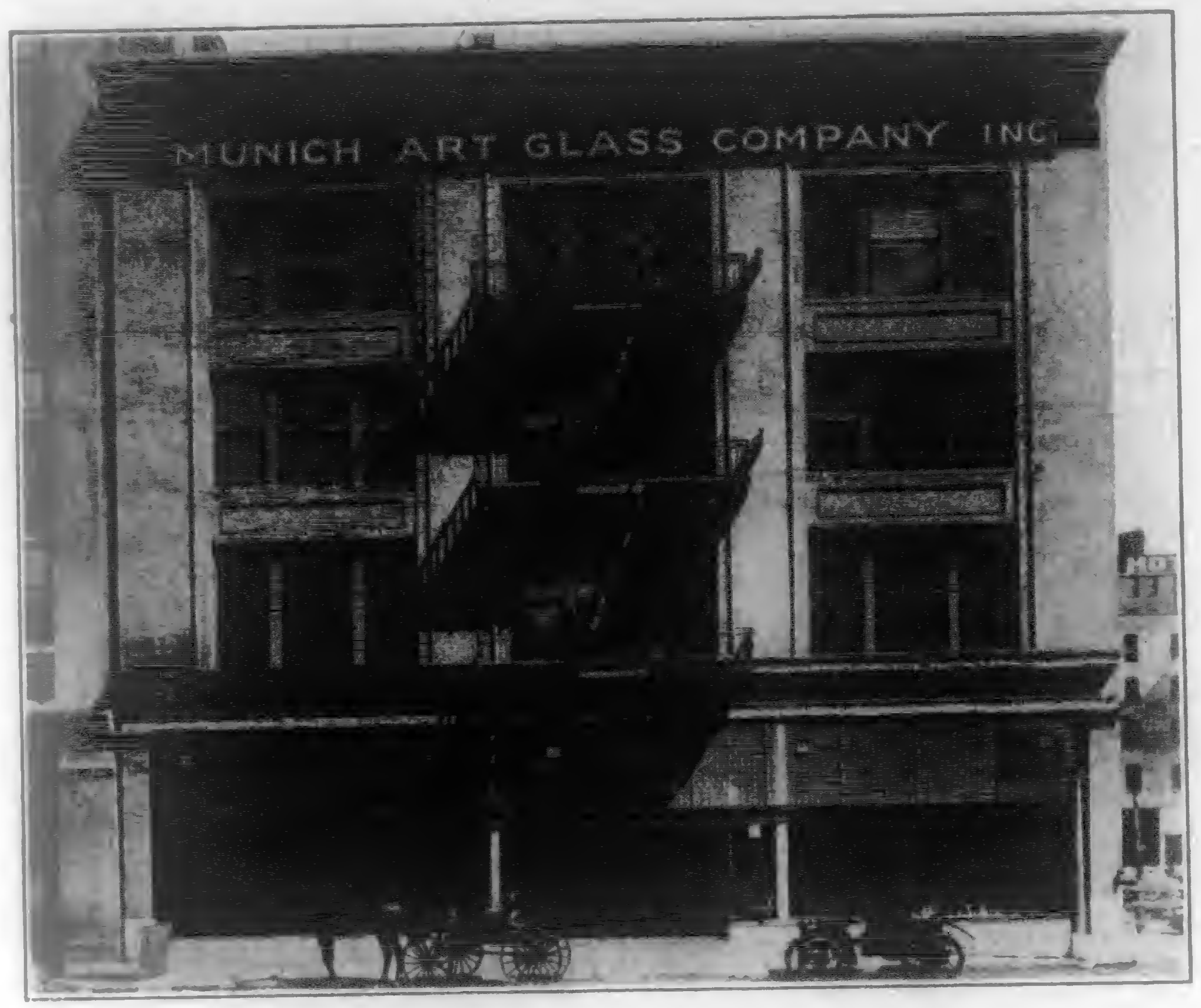
As the work progresses you should be able to see what will be required next, and thus, keeping in advance of your men, you will not permit anything to drag that will cause delay. At the end of each day you should see just what headway has been made, and thus be in a position to begin the following day's labor with a correct idea of what is to be done. In this way you are not likely to make serious errors, and where there are no serious accidents the work will go forward in a satisfactory manner all around.

Many people are a trifle cranky about the erection of a building, and some of them are inclined to believe that they know more than either architect or builder, and these things make the work at times harder. Stick to your contract to the letter, and if there are any alterations that require more than ordinary time and labor, see that they are paid for; otherwise you will lose money. Some people are unreasonable in that they will expect too much from a builder and that they will not give the time that much of the labor entails. Most of us want things in a hurry these days, and the builder is one man who must work hurriedly and at the same time slowly. He must do his work well, but he must not waste time. Every hour means much for him, and more for the men who are working under him.

To the builder who is just starting out for himself there are lessons to be learned that will try his patience, but the man who cannot gain by each new problem is not the man who will conquer in the end. A full understanding of the things that are for him to know should be borne in mind, and his eyes and ears should be ever ready to get an idea that will be helpful in bettering the labor that he has set about to do, and thus increase his possibilities and make sure his life work.

Concrete and Artificial Stone Work.

A. Lynch & Co. have been doing considerable work of late in reinforced concrete construction, being in splendid shape to handle this class of work with all possible speed. Artificial stone pavement is also a specialty of this company. I[illegible] offices are in the Builders' Exchange b[illegible]'ing, San Francisco.



New Home of the Munich Art Glass Company, San Francisco
Crim & Scott, Architects

STAINED GLASS AND ONE OF ITS MAKERS

WHENEVER a painter's art is called into discussion, one phase of it in particular is made basis of his rights to fame. In fact, in that phase lies all that there is to art; namely, light and shade. Whether a picture portrays the emotions of humanity or the spaces of Nature, all its character and fancy, realism and romance, anatomy, atmosphere and composition, are but arrangements of light and shade.

In an oil painting this is accomplished by an illusion; or, to be more accurate, the color produces an illusion. The color itself stands for the effect of light shining upon color. So that, with canvas and oils, both opaque mediums, is achieved the effect of depth and shade, light and translucency.

Stained glass exemplifies the reverse process. With translucent and semi-translucent materials, is produced the same picture, but with what greater degree of realism and spectacular brilliance! While the major portion of the canvas is devoted to shadow, the field of the stained glass is a profuse illumination. Instead of painting sunlight with chromes and clays, use is made of the sunlight itself. It enters the picture and becomes a part of it. Instead of being a sunlit scene of artificial color upon canvas, the very sunlight becomes a canvas, veiled and let free in the gorgeous web of the glass-cutter's art.

Of all the arts, that of stained glass is least contaminated by the cheapness of overproduction and reproduction. Bringing with it the richness and atmosphere of mediaeval cathedrals, it at once dominates its environment and attracts attention. It gives a glow of imagery to the commonplace and adds splendor to the noblest architecture.

San Francisco, in accordance with its many lines of advance during the last three years, can now take equal place with Eastern and European studios producing stained glass. It is not long since, that San Francisco sent to the factories of New York and Europe for its art windows. Today there are several establishments that are turning out creditable work, and one whose output vies with the best designs and workmanship of the Old World is the Munich Art Glass Company, located at 667 Mission street.



Art Glass Window, St. Agnes Church, San Francisco
Designed and executed by Munich Art Glass Company

This firm came into being with the impetus that gave to the new San Francisco a development that has been the wonder of the rest of the world, which in an artistic way, can be compared only to the Renaissance that illuminated Europe in the XV Century.

Exemplifying their workmanship are the windows in the Church of St. Agnes, portraying the young saint's martyrdom, depicting her with rare charm and utmost religious feeling. The rose-window, centered with the head of the Saviour, radiates a wealth of deep golden tones that will make it peer with the famous examples of devotional glass.

Architects and owners of San Francisco's finest edifices have been quick to recognize the worth of this young firm, which, in a short time, will have contributed at large to the beauty of the Western metropolis.

A steady increase of business has necessitated the leasing of larger and more centrally located quarters in a new building at Mission street, near Third, where one of the largest art glass studios on the Pacific Coast has been fitted up.

Steel for Concrete Reinforcement.

The Tayler & Spotswood Company is prepared to bid on reinforcing material of any size, and will ship to almost any point within a radius of 200 miles of San Francisco. This firm is in a position to quote prices on cold twisted steel bars as low as any concern in the business, with a guarantee of prompt deliveries. Contractors will do well to get in touch with these people before buying their reinforcing material. The general offices are in the Monadnock building, San Francisco.



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Crim & Scott, Architects

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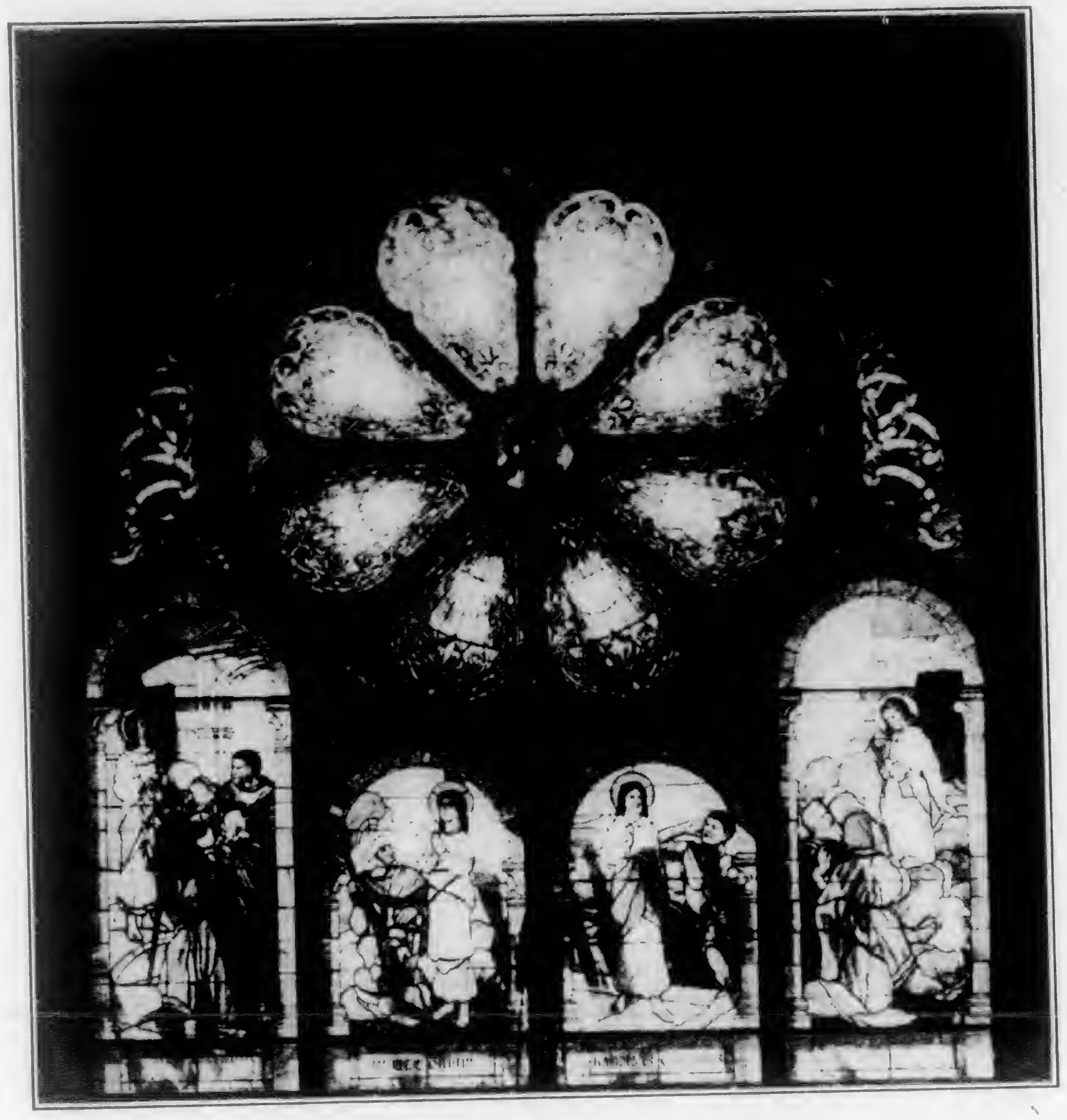
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Concrete Sewers Still in Service After Centuries.

A recent issue of the Denver News has the following:

The report made Monday evening by W. W. Booth, Charles P. Allen and J. H. Evans, to the Improvement Association on concrete pipe sewer is of especial interest. These gentlemen were appointed a committee to investigate fully and report upon the relative merits of concrete and vitrified-pipe sewers. This committee is composed of men thoroughly competent, by past experience, to handle this matter and their conclusions carry more than ordinary weight with the people of Denver. They went to a great deal of trouble to consult experts, and obtain reliable facts, concerning both kinds of pipe.

"They reported that cement sewers were still in existence after a service of hundreds of years, and in some cases thousands of years: That the old concrete sewers of Rome and Paris were in alkali soil, and under as severe conditions as could possibly occur in Denver. They learned that some 84 American cities are giving concrete pipe the preference, for both sanitary and storm sewers, claiming that cement pipe is more efficient, because always perfectly true, therefore rendering the joints absolutely true: That it is more durable, because it will stand moisture and freezing; That it is less brittle, becoming tougher and harder the older it grows. It is also more economical and would save the city an immense sum of money. They reported, that it is found to be impossible to make clay pipe that is perfectly true in form, or at the joints; that clay pipe is extremely brittle, and will not stand even very light jars; that if it becomes soaked with water and freezes, it disintegrates. The reports of the various city engineers showed that no ill effects had ever been shown in well formed cement pipe, from the effect of acid or alkali in ordinary soil or sewerage; they found that concrete pipe that has been exposed to the alternate wetting and drying at salt water, was not effected by the strong alkalies in same.

For these reasons, which were fully stated in a very long and exhaustive report, they recommended concrete pipe. The Improvement Association was so thoroughly convinced they were right, that the opposition to concrete pipe, which had been worked up during the last several weeks by the clay interests, was entirely overcome, and concrete pipe was unanimously adopted.

An Index to the Advertisements

[Index continued on Page 120.]

Book Reviews.

Building construction and Superintendence. By F. E. Kidder, C. E., Ph. D., Architect Fellow of the American Institute of Architects. Price, $6. New York: William T. Comstock.

The first edition of this work was brought out in 1896 and had 421 pages and 260 illustrations, and since then as the different editions have been issued slight revisions have been made and occasional pages interpolated, but meanwhile the art of masonry has advanced until just before his death Mr. Kidder determined that it was necessary to reconstruct the whole work.

The work when first issued was the most complete representation of masonry that had up to then appeared, and the present edition in like manner represents the latest and best modern practice and all the new ideas and their application as developed up to this time.

The work bears evidence of the time, labor, thought and persistent effort that has been put forth to collate, arrange and properly classify all the data that belong to the latest and modern accepted practices.

The chapter on "Concrete and Reinforced Concrete Construction" is entirely new and contains much more detailed information than many books on the subject. The chapter on Fireproofing is substantially new and has over 200 illustrations. Even in the old stand-by brick great changes have taken place, sand-lime brick being a new building material since Mr. Kidder's day. The chapter on specifications shows many and important changes, such as those on cement and concrete construction, where new specifications are given.

The Utilization of Wood Waste by Distillation.

A general consideration of the new industry, including a full description of the distilling apparatus used and the principle involved, also methods of chemical control and disposal of the products, first edition illustrated by seventy-four engravings, 156 pages. This book is cloth bound; it will be sent to any address postpaid on receipt of $3.20. Address Wood Waste Distilleries Co., Cleveland, O.

All About Cork.

The Armstrong Cork Company has recently published a handsome book, appropriately named "Cork," being the story of the origin of cork, the processes employed in its manufacture, and its various uses in the world to-day. The illustrations are exceptionally fine and the presswork is of a high grade. The company will be pleased to mail a copy of the book to all readers of this magazine without charge. The home office is at Pittsburg, Pa.

A Live Firm.

One of the most important features of the interior furnishing of a building, be it a business house, an office or a private residence, is the lighting fixtures, for upon this branch of the interior fittings depends, in great measure, the harmony of the decorations.

The advance made in the manufacture of gas and electric lighting fixtures, in the past few years, has kept pace with the development of the aesthetic taste of the American people, and the exacting requirements of the architects, in planning novel effects in lighting.

In no place has the standard of requirement been higher than in Berke-

ADVERTISERS' INDEX—Continued from Page 117

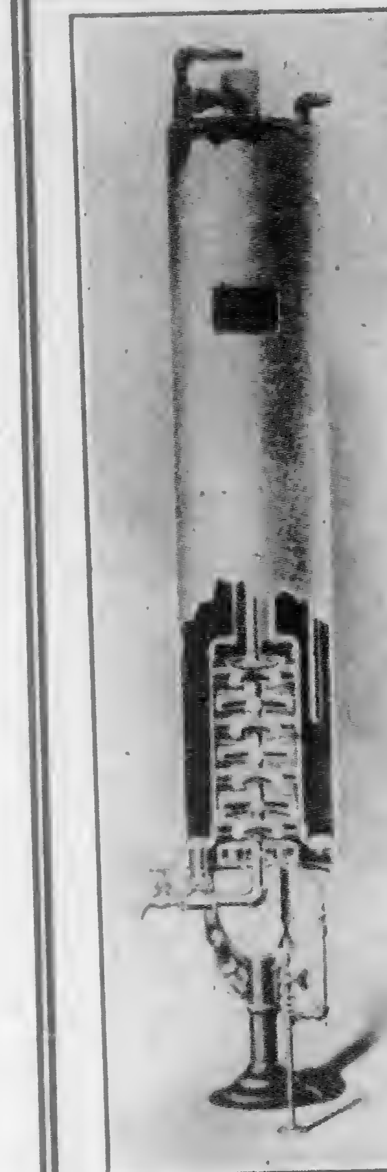
ley, in the homes of the residents of the University town, and the demand has made it necessary to establish a business house where needs of the most fastidious person can be supplied. This has been done by George R. Greenleaf, who is located at 2107-2111 Addison street, Berkeley. Some of the most elaborate designs of the leading Eastern manufacturers are carried in stock, indeed, there are few retail dealers in San Francisco whose stock offers a greater variety to the purchaser.

Mr. Greenleaf is fortunate in having secured the services of Mr. Kellogg, who has been for many years in this line of business and is an expert in the manufacture of lighting fixtures. In the workshop only experienced men are employed, which accounts for the high reputation which has been built up by this firm.

Mr. Greenleaf is displaying a very beautiful new design, the California Trillium, in a conventional pattern, the pattern for which was drawn by Prof. Myers, formerly of the University of California, and which lamp is manufactured especially for Mr. Greenleaf, by a New York firm.

The store supplies everything that enters into a lighting scheme, either for interior or for exterior decoration.

On the completion of the building at the corner of University and Shattuck avenues, now being erected by the Mason-McDuffie Company, Mr. Greenleaf will occupy one of the stores, where he will have much larger and better arranged quarters.







Dominion Trust Building, Vancouver, B. C.

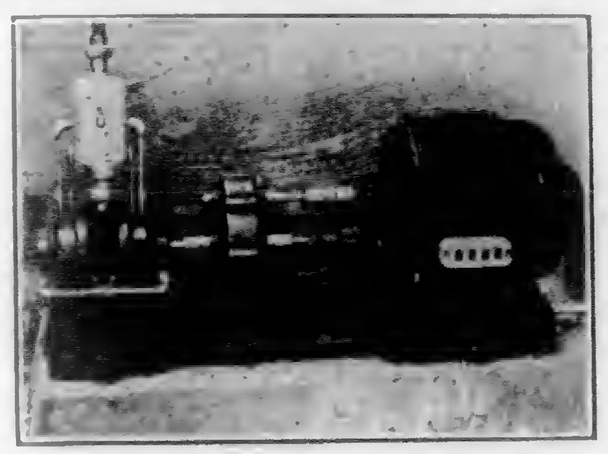
Van Emon Elevators in a Thirteen Story Sky Scraper.

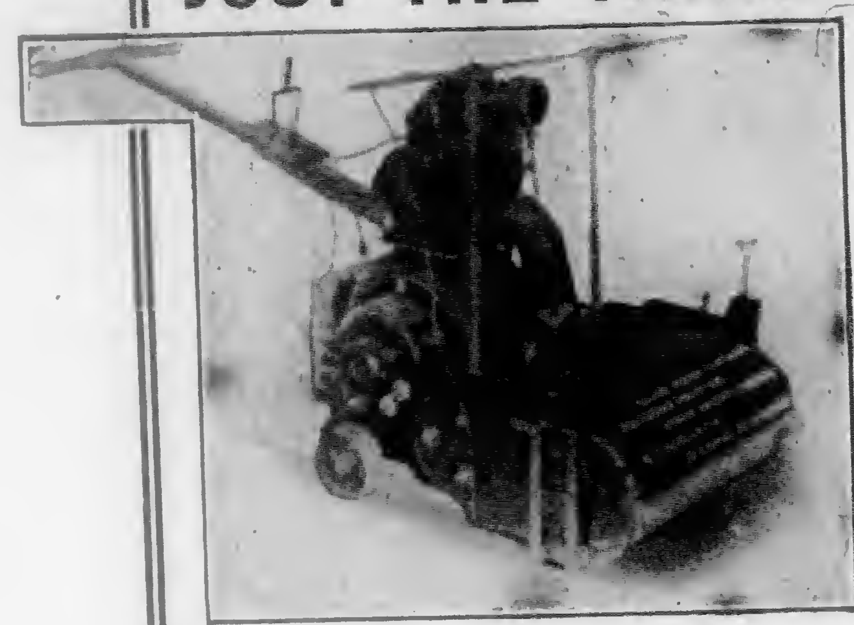
After very careful consideration of the engineering problems involved in the selection of an electric elevator installation for the thirteen story Dominion Trust building at Vancouver, B. C., Architect Helyer decided to equip the building with four Van Emon high duty tandem electric passenger elevators guaranteed to lift 2000 pounds of dead weight at a speed of 350 feet per minute.

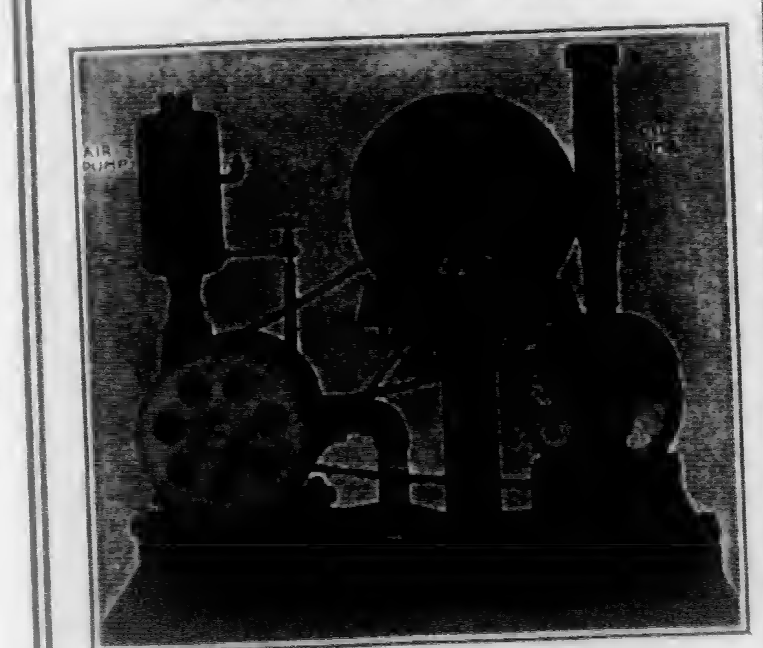
Each of the four passenger elevators will also have a complete flash light electric signal system of the most artistic finish and modern design. On each landing, lighted globes will indicate to the passenger the approach of his car and an electric signal lamp in the cars will advise the elevator operator that at one or more floors, above or below his car, passengers are waiting.

The manufacturing plant of the Van Emon Elevator Company is located on tidewater in West Berkeley and has its own spur track connecting with the main line tracks of the Southern Pacific Railroad. This elevator plant, with its large machine shop, electric manufacturing department, foundry and woodworking and









pattern shop, employs more than a hundred men when manufacturing its full output.

Its machinery and equipment is of the latest design and its engineers are men of national reputation.

The reputation of the Van Emon Electric Magnetic Control Elevator has secured the company important contracts in all the leading Pacific Coast cities and the competition it has sustained against the "Elevator Trust" has saved owners hundreds of thousands of dollars, during the past few years.

Many Contracts for Machinery and Electrical Company.

The Machinery and Electrical Company of Los Angeles continues to do a good part of the heating and ventilating work in Southern California, having the support of the leading architects in Los Angeles and vicinity. Recent contracts taken by the company for heating systems include the University of Redlands, in which will be installed a steam blast system, Scotch boiler, Sturtevant blowers and the National thermostat, Norman F. Marsh, architect; the Troop Polytechnic Institute at Pasadena, Myron Hunt and Elmer Grey, architects; the palatial Henry E. Huntington residence, Myron Hunt and Elmer Grey, architects; Chino high school, Brawley school, high school at Tempe, Ariz., Lowell school at Redlands, Lagonia high school, technical school at San Bernardino, Covina high school, Ontario high school, Logan Heights school of San Diego, and Glendale high school. Work on a dozen other schools is being finished, besides various church and residence contracts, including the fine new Christian church at Pomona.

Birch in Natural Finish.

Almost invariably birch trim on the Pacific Coast has been mahoganized—that is, stained to imitate another wood. It remained for Architect A. H. Jacobs to introduce the use of birch in natural finish. This he has done in a most delightful manner in the fixtures in Altman's store, on Geary street, San Francisco. The stiles and rails of the fixtures are plain birch, while the panels are of curly birch, all finished in natural color. The panels were made by White Bros., hardwood lumber dealers of San Francisco, who have also executed some very beautiful birdseye maple panels for the Davis-Schonwasser store. White Bros. have a large stock of panels on hand, and an examination of their showrooms is a revelation in panel making.

Roofed Many Pissis Buildings.

The following buildings, designed by Mr. Albert Pissis, architect, have been covered by the Watson Roof Company:

Emporium, with felt and gravel roof.

White House, with felt and gravel roof.

German Savings and Loan Society, with the "Watsonite" roof.

Mercantile Trust, with the "Watsonite" roof.

Hibernia Bank, with the "Watsonite" roof.

Nutall building, with felt and gravel roof.

High-Class Plumbing.

Alex. Coleman, registered plumber, at 1705 Ellis street, San Francisco, did the plumbing in the Cordes-Rochat building, Albert Pissis, architect, illustrated elsewhere in this number of The Architect and Engineer. Mr. Coleman also installed the plumbing in the Misses Butler building on the northwest corner of Powell and Ellis streets, Albert Pissis, architect. Mr. Coleman makes a specialty of plumbing large hotels and office buildings or structures of class A type, giving his personal supervision to all such work. Among the other buildings of which he was the plumbing contractor should be mentioned the Yerba Buena school, Madison grammar school, Russ

building—Montgomery street, from Pine to Bush; Belmont Hotel, Eddy street, near Van Ness avenue; Miles' Hotel, a seven-story building on the northeast corner of O'Farrell and Jones streets; Eddy Hotel, Eddy and Taylor streets; Central Trust building, northeast corner of Golden Gate and Van Ness avenues; Getz apartments, Twentieth and Bryant streets, and many others.

Believes in Advertising.

The Architect and Engineer is one of several leading publications selected by the Star Expansion Bolt Company for advertising purposes. Following is an extract from a letter recently addressed to various business concerns by the expansion bolt company:

"Do you believe in advertising?"

"We do—strong! And we do a lot of it."

"You probably don't know it, but we have been gradually increasing our advertising during the last few years until to-day we are using 42 representative trade journals and several popular magazines to educate the building public up to the use of Star Expansion Bolts and Star Screw Anchors.

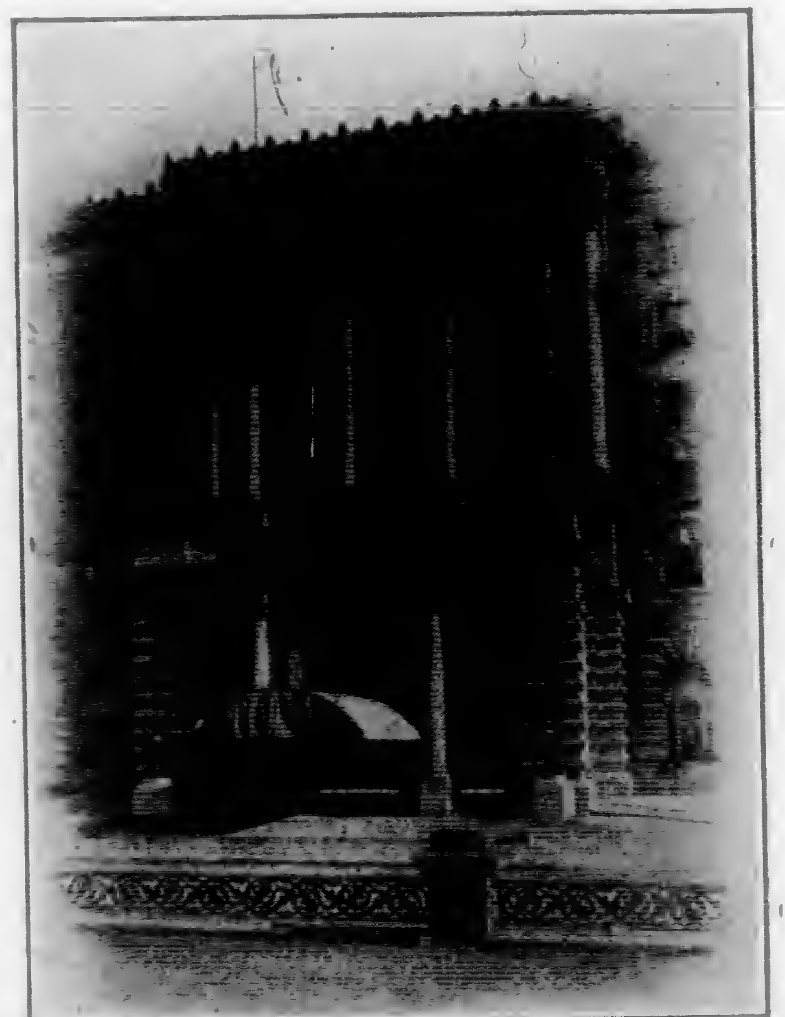
"As a result of extensive advertising we receive hundreds of inquiries each week, from all sections of the country. The proportion of men who take the trouble to write to us, however, is very small compared to the number who see our advertisement, say, 'That's what I've been looking for—for a coon's age,' then go straightway to their dealer to buy what they want for trial purposes.

"Long ago we realized that our own best interests were identical with those of the dealer. Long ago we realized that by creating business for the dealer we were creating business for ourselves. For is not the dealer ready and willing to carry and push the line for which the manufacturers are creating a demand and sale?

"We carry a full line of Star Expansion Shields, Star Screw Anchors, Star Toggle Bolts, Star Drill Holders and Star Enameled Bridle Rings, at either of the following branches: 147 Cedar street, New York City; 142 Lake street, Chicago, Ill.; 1023 Maison Blanche Bldg., New Orleans, La.; 1010 Howard street, San Francisco, Cal."

Ideas on Plumbing Fixtures.

Haines, Jones & Cadbury Company, makers of high-class plumbing supplies, invite architects and builders to visit their showrooms at 846 Bryant street, San Francisco. It is no trouble to show visitors the latest things in plumbing fixtures. If too busy to call, send for a catalogue, which will be mailed free by mentioning this magazine.



NOTICE TO CONTRACTORS

Washington, D. C., U. S. A.,
May 8, 1909.

The Chinese Government, through its representatives, invites sealed proposals for the erection and completion of a group of buildings to be used as a Bureau of Engraving and Printing in Peking, China, in accordance with plans and specifications prepared by Architects Milburn, Heister & Co., Home Life Bldg., Washington, D. C. Said plans and specifications will be on file on and after May 15th at the following places:

Architects' Office, Washington, D. C.
Chinese Consulate, New York City.
Chinese Consulate, San Francisco, Cal.
Chinese Legation, London, England.
Chinese Legation, Berlin, Germany.
The Ta Ching Government Bank, Peking, Tientsin, Shanghai, Canton, China.

Bids from America and Europe must be filed with the Chinese Legation at Washington, D. C. on or before July 15, 1909. Contractors figuring on this work are requested to submit separate proposals for each or a part of the following main headings:

1. All buildings complete, including all excavation, concrete work, mill work, etc., required in connection with the mechanical plant.
2. All work as shown by the plans and specified under the head of Mechanical Plant.
3. All steel lockers, as shown and specified, press room busses shown on sheets Nos. 30 and 31, benches and tables specified for the fourth floor dining room, and tank in wetting room on second floor.

Contractors wanting to figure on the separate parts of the work are requested to file their bids at the same time and place as the bids for the work as a whole. Each proposal shall be in sealed envelope and marked plainly "Bid for work for Chinese Bureau of Engraving and Printing, Peking, China."

The successful contractors are given notice that they will be paid 80 per cent on the work as the same progresses, retaining 20 per cent until final completion and acceptance. Each contractor is given notice that he will be required to give a guarantee company's bond, payable to the Chinese Government, in sum of 50 per cent of the contract price, for the faithful performance of his part of the work, should his bid be accepted.

The Chinese Government reserves the right to reject any or all bids. All inquiries in reference to the work should be addressed to the Architects.

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VOLUME #
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VOLUME XVIII
No. 1

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THE ARCHITECT and ENGINEER

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Goodyear Rubber Co....587 Market St., S. F.

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South Amboy Terra Cotta Co., Boyd & Moore, Agents......356 Market St., S. F.

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Moore & Hardin,
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Ainsworth Bldg., Portland, Ore.
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- Standard Supply Co., First St. and Broadway, Oakland
- Pacific Portland Cement Co., Pacific Bldg., S. F.
- Western Building Material Co., 430 California St., S. F.
- The Building Material Co., "White Portland," 587 Monadnock Bldg., S. F.
- Balfour, Guthrie & Co., San Francisco and Portland
- Kerr, Gifford & Co., Concord Bldg., Portland, Ore.
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- Dodds' Interlocking Block Company, 24 California St., S. F.
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- Makowski Plaster Block, 426 Crocker Building, S. F.

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- W. N. Whitmore, 3203 E. 17th St., Fruitvale, Cal.

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- Weatherproof Coating. Made by Parker, Preston & Co., Inc. Pacific Coast Branch, Central Building, Los Angeles

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- "Vitrolite" Cold Water Paint, sold by Boyd & Moore......356 Market St., S. F.

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- Dresser, McDonnell & Co., 39-49 Isis St., S. F.

CHURCH FURNITURE
- Spencer Desk Co....Monadnock Bldg., S. F.
- C. F. Weber & Co......365 Market St., S. F.

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- Coltrin Concrete Mixers, N. J. Morehouse, Western Agent, Waterloo, Iowa; J. L. Mery Eng. Co., Monadnock Bldg., S. F.; V. W. Mason, St. Johns, Oregon.
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- Chas. F. Beebe Co., Agents Smith Concrete Mixers......................Portland, Ore.
- Chicago Improved Cube Mixer, Pacific Coast Offices, 789 Folsom St., S. F., and F. T. Crowe & Co., Portland and Seattle.

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- A. Lynch & Co., 314 Builders' Exchange Bldg., S. F.

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- Reinforced Concrete Pipe Company, 716 Central Bldg., L. A. Monadnock Bldg., S. F.

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- Clinton Fireproofing System, L. A. Norris, Monadnock Bldg., S. F.
- Corrugated Bars sold by John B. Leonard, C. E. Sheldon Bldg., S. F.
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- Ransome Concrete Co....Crocker Bldg., S. F.
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- Webster-Mace Construction Co., Merchants' Exchange Bldg., S. F.
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- Rickon-Ehrhart Eng. & Const. Co., 1859 Geary St., S. F.
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R. I. W. sold by Willkomm Supply Co., 151 Tehama St., S. F.
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"Protectorine," sold by Boyd & Moore........356 Market St., S. F.

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A. C. Thode............860 Waller St., S. F.
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Oregon Engineering Co. Beck Building, Portland, Or.
Latchem Engineering & Electric Co., 214 Ellis St., S. F.

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Van Emon Elevator Co., 54 Natoma St., S. F.
Wells & Spencer Machine Co., 139 Beale St., S. F.
Hammond Elevator Co.. Seventh and King Sts., S. F.

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Thos. B. Leonard........Sheldon Bldg.; S. F.
W. W. Breite...........Clunie Bldg., S. F.
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Charles List......211 Williams Bldg., S. F.
F. J. Amweg, C. E., 700 Marston Bldg., S. F.

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United Glass Co.........115 Turk St., S. F.
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Willkomm Building Supply Co., 151 Tehama St., S. F.
W. H. Judson Art Glass Co. 720 S. Broadway, Los Angeles, Cal.
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San Francisco Art Glass, 944 Mission St., S. F.

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California Bldg. Material Co., Pacific Bldg., S. F.

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Boyd & Moore......356 Market St., S. F.

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White Brothers, Cor. Spear and Howard Sts., S. F.
Dieckman Hardwood Co., Welch Bldg., S. F.

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Reno Hard Wall Plaster, sold by Western Building Material Co., 340 Steuart St., S. F.
Adamant Co......Worcester Bldg., Portland
Nevada Gypsum Hard Wall Plaster Co., Pacific Bldg., S. F.
Mound House Plaster Co., "Regan" Brand, 1417 Metropolis Bank Bldg., S. F.

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Burness & Martin, 129 Sixteenth St., Portland
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Thos. E. Hulme & Co., 275 Fifth St., Portland
C. L. Johnson & Co., 285 Grand Ave., Portland
Gardner & Kendall Heating Co., 40-42 Second St., Portland, Ore.
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Solar Heater Co., 333 New High St., Los Angeles
Mangrum & Otter, Inc., 507 Mission St., S. F.
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United Builders' Supply Co., 687 Mission St., S. F.

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W. E. Leland..Merchants' Exch. Bldg., S. F.

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Argonaut Hotel Fourth St., bet. Market and Mission, S. F.
Fairmont Hotel, California and Powell Sts., S. F.

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O. Barbi..........612 Washington St., S. F.
Ideal Concrete Construction Co., 102 Grand Ave., Portland, Ore.

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Voss, Conrad & Co..Modnadnock Bldg., S. F.

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Pacific Laboratories, Inc., 558 Market St., S. F.
Western Inspection Bureau, Monadnock Bldg., S. F.

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C. E. Gordon..........1235 Pierce St., S. F.
Schastey & Vollmer..1930 Van Ness Ave., S. F.
W. W. Tucker, Fourteenth and Webster Sts., Oakland
Pfister & Co...........169 Grove St., S. F.

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Western Builders' Supply Co., 680 Mission St., S. F.

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Eastern Reinforced Tray Co., Eighteenth and Clementina Sts., S. F.
J. F. Reilly & Co......Spencer Place, S. F.
Peerless Mfg Co....364 Eleventh St., S. F.
"Anchor Brand" Cement Tray, manufactured by Portland Cement Laundry Tray Co...............289 Union ave., Portland

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The Enos Company..1748 California St., S. F.
Adams & Hollopeter....745 Mission St., S. F.
Morrison Electric Co., 291 Morrison St., Portland

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Santa Fe Lumber Co. Seventeenth and De Haro Sts., S. F.

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Eby Machinery Co....Hansford Bldg., S. F.
Steiger & Kerr Stove & Foundry Co., Folsom and 18th Sts., S. F.

MAGNESITE
California Magnesite Co., 1352 Palmetto St, Los Angeles

MAILING CASES
Mailing Case Mfg. Co., 264 Natoma St., S. F.

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W. W. Montague & Co., 557 Market St., S. F.

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Joseph Musto Sons—Keenan Co., 535-565 North Point St., S. F.
Italian & American Marble Works, Sixteenth and Carolina Sts., S. F.
Western Magnesite Development Co., Metropolis Bank Bldg., S. F.
Baxter Marble Co...........Call Bldg., S. F.
Columbia Marble Co., 268 Market St., S. F.

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Goodyear Rubber Company, 587-591 Market St., S. F.

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San Francisco Metal Stamping & Corrugating Co..........296 Eleventh St., S. F.
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Portland Sheet Metal Works, E. 7th and E. Madison Sts., Portland, Ore.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL DOORS AND WINDOWS
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Portland Sheet Metal Works, Portland, Ore.

MILL WORK
Enterprise Mfg. Co............Stockton, Cal.

MOTORS, GENERATORS, ETC.
Western Electric Works,
61 Sixth St., Portland, Ore.

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McCormick & Henderson,
Postal Telegraph Bldg., S. F.

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California Oil Burner Co............Oakland
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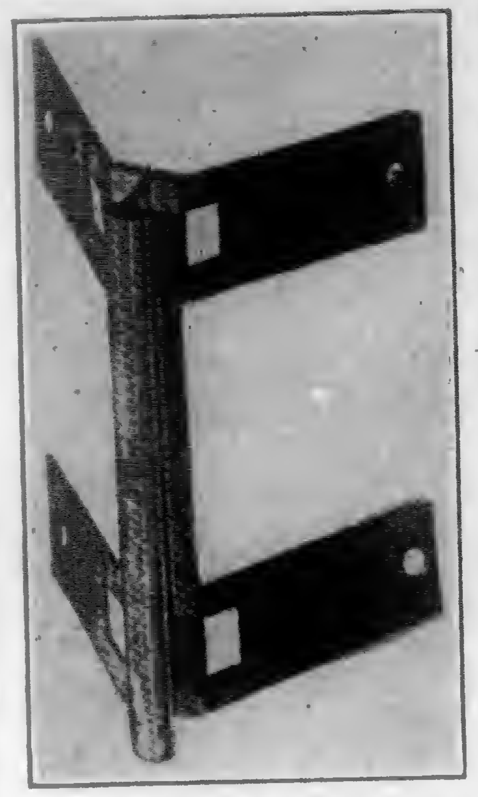
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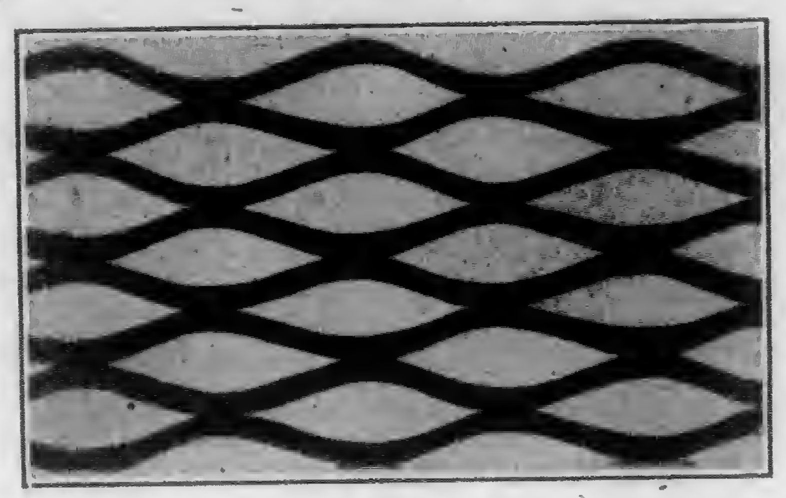
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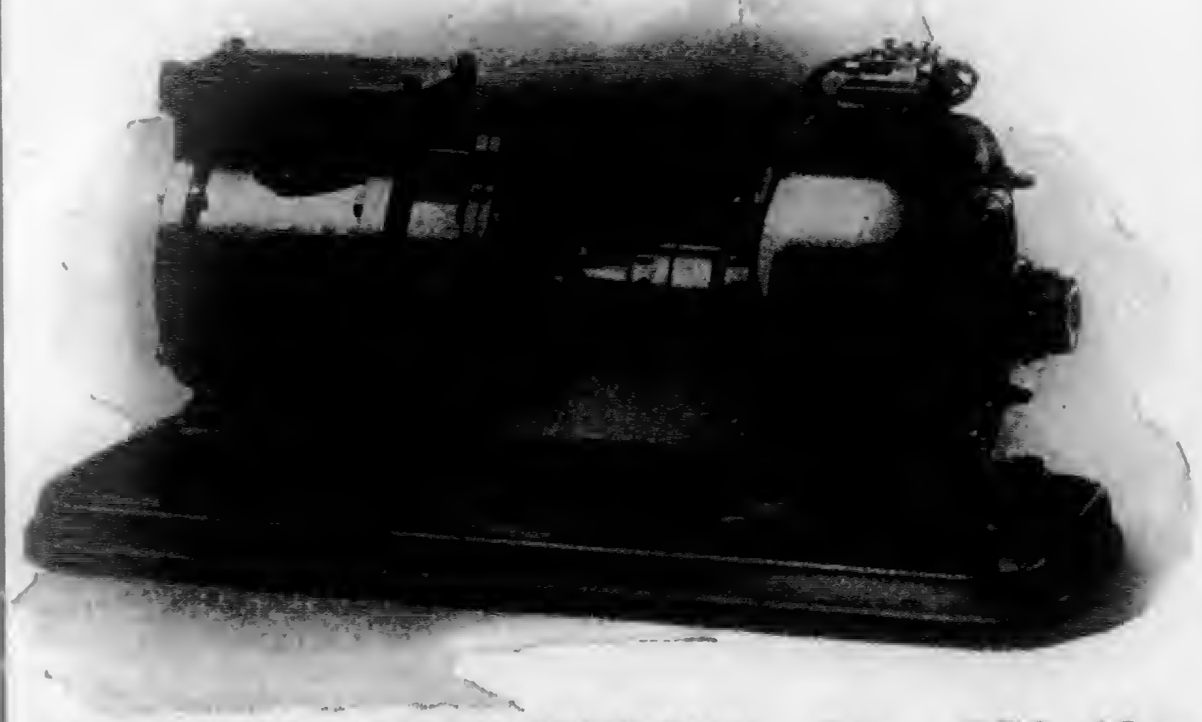
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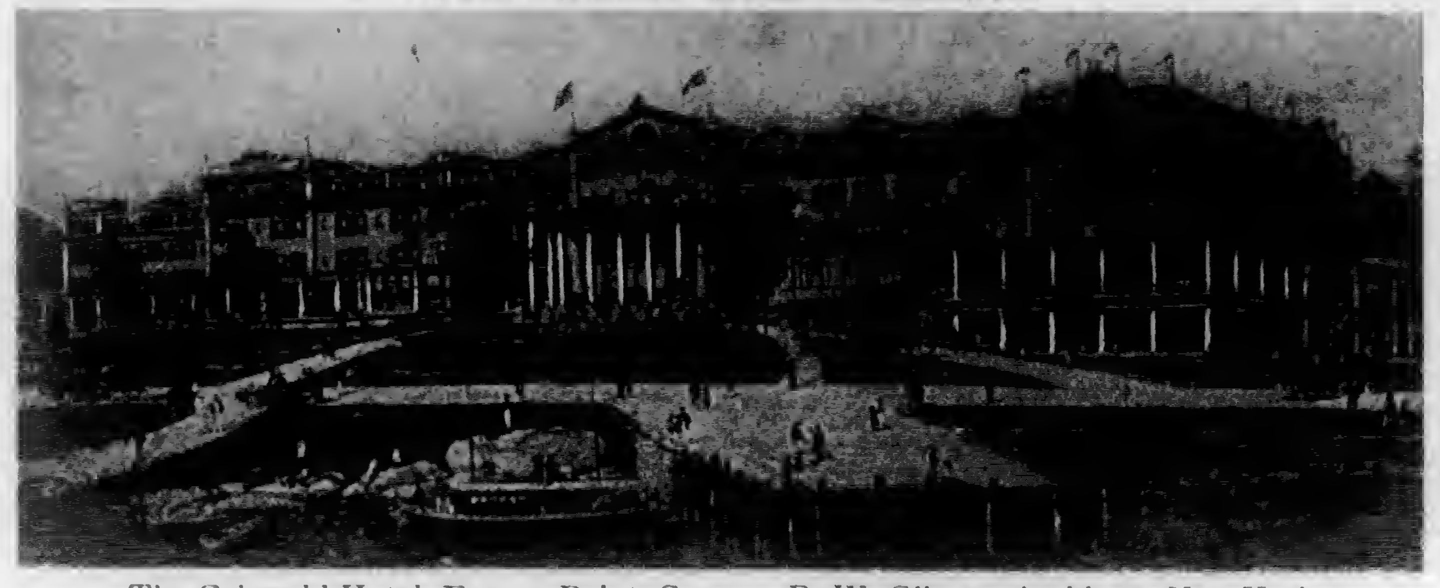
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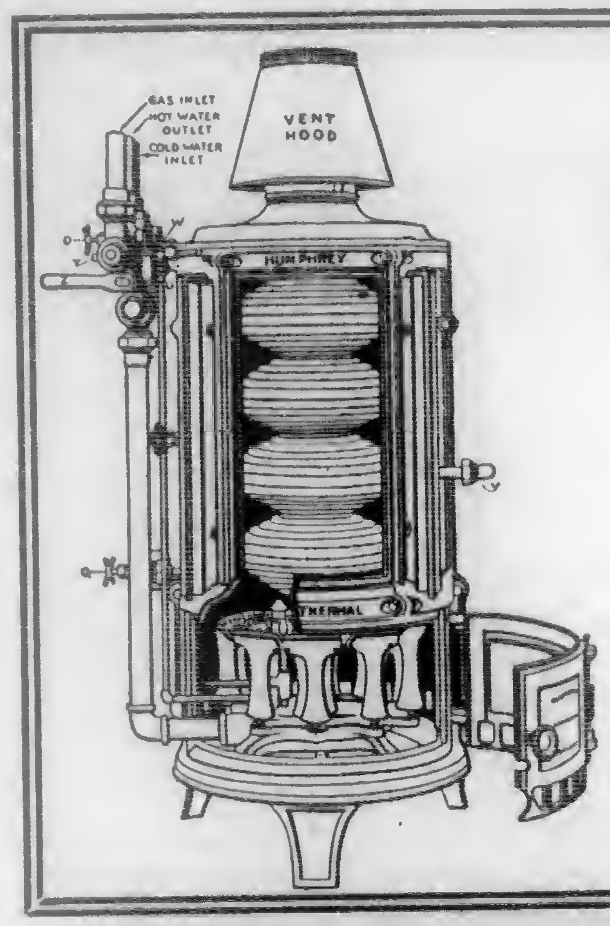
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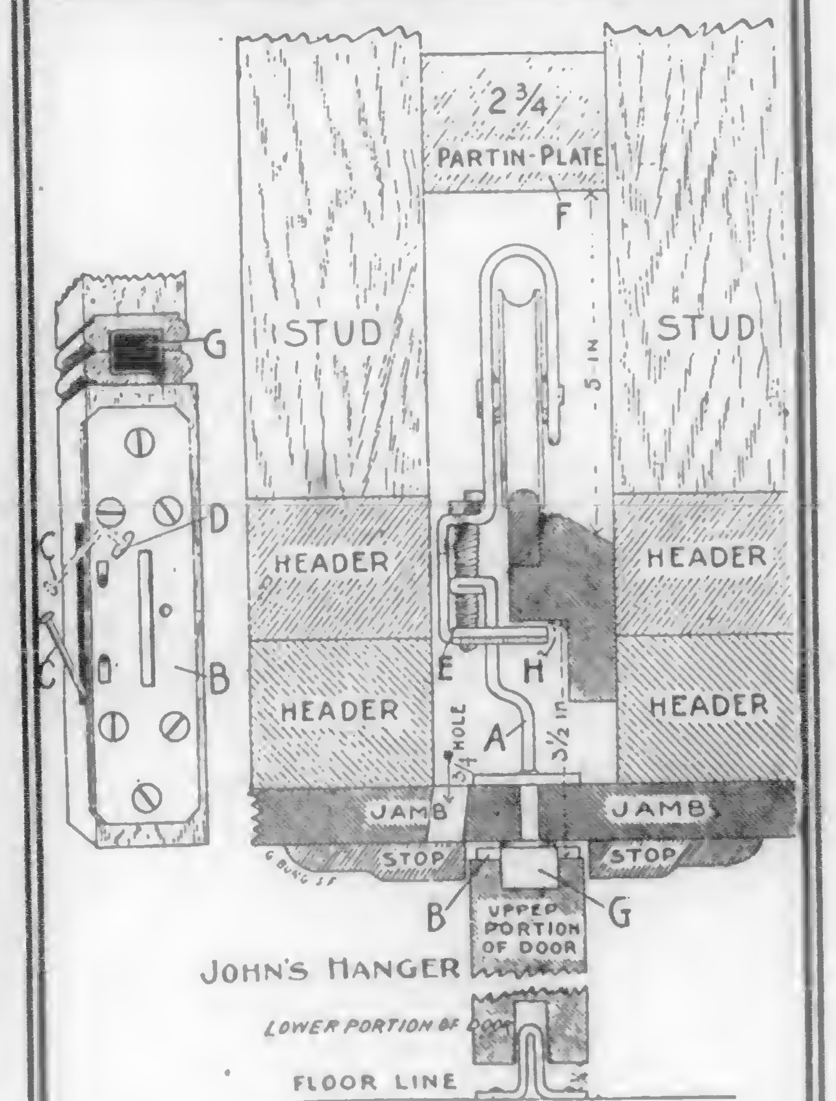
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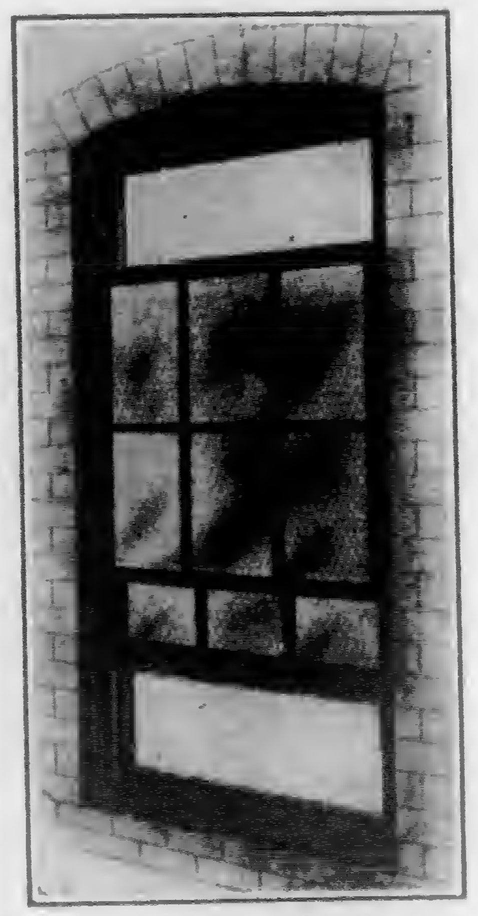
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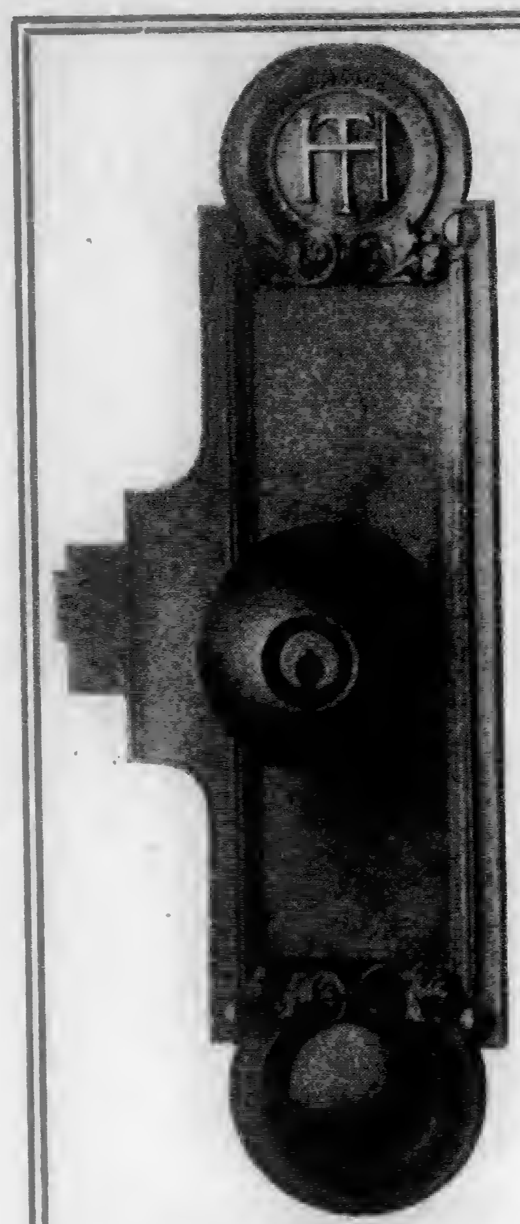
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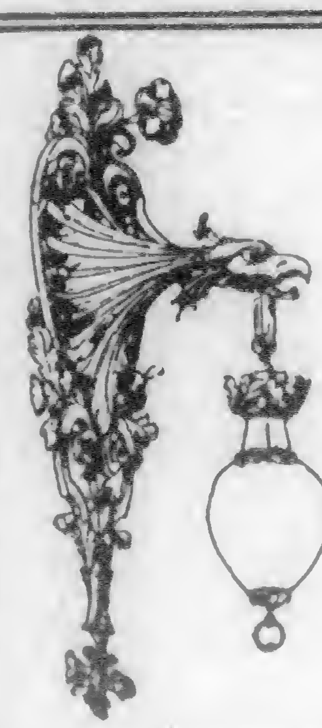
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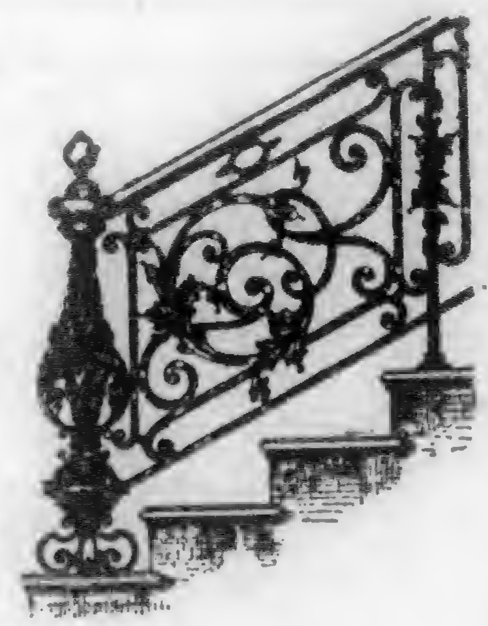


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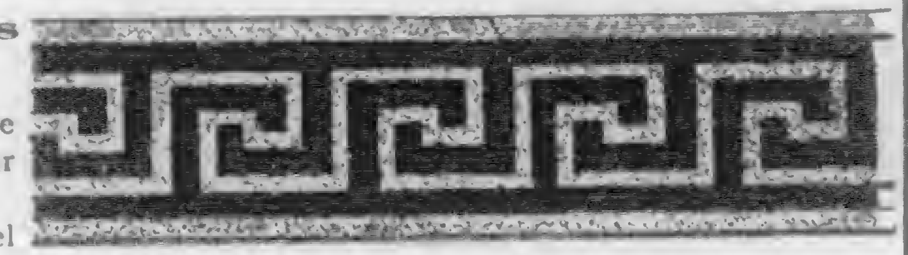


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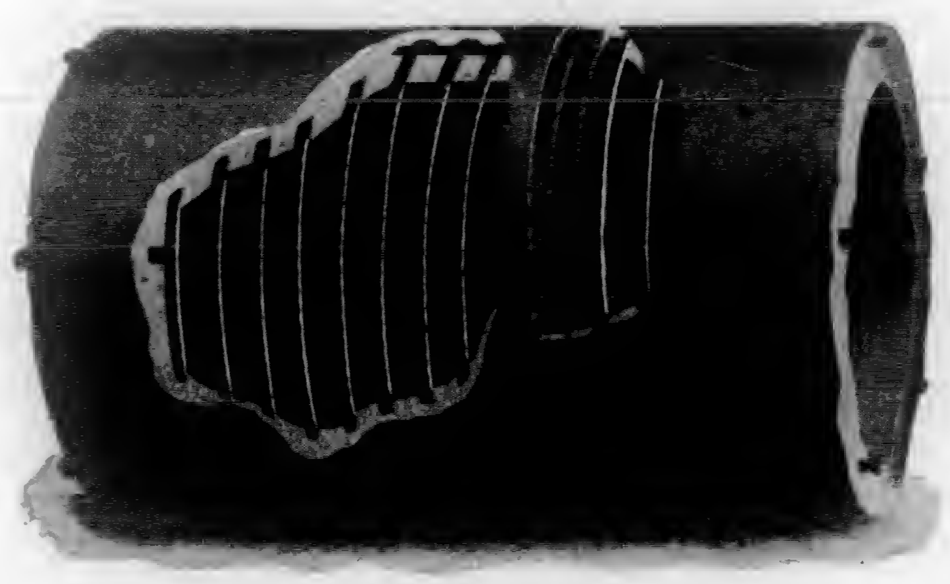
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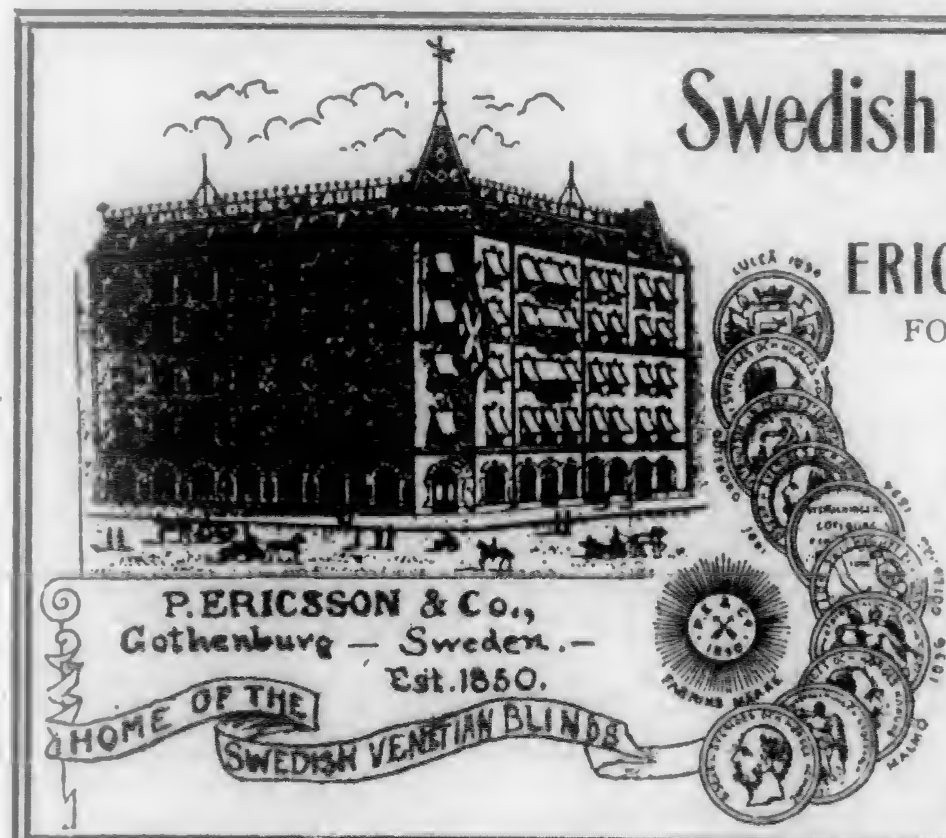
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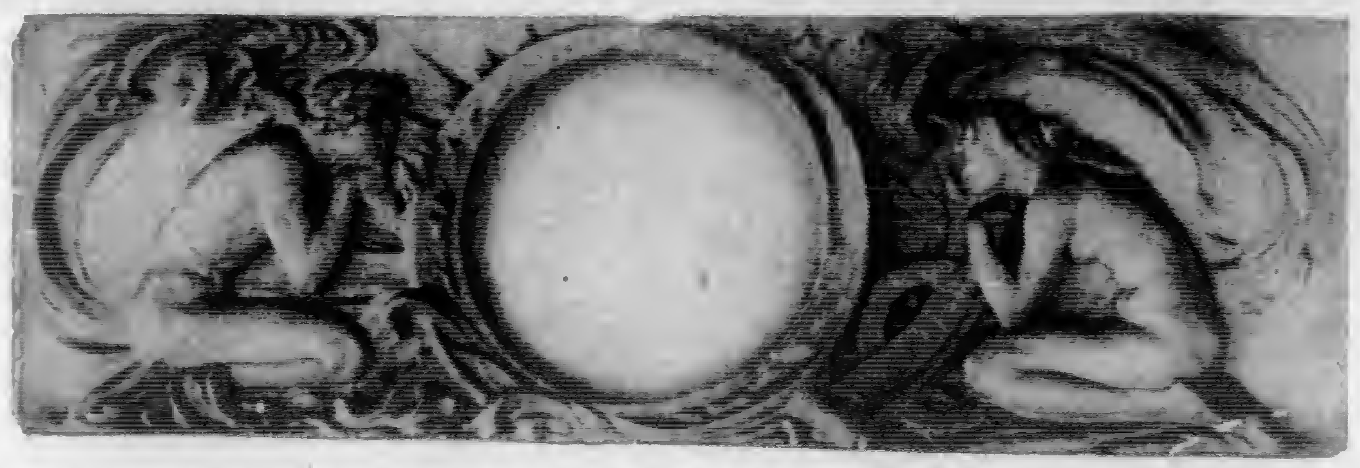
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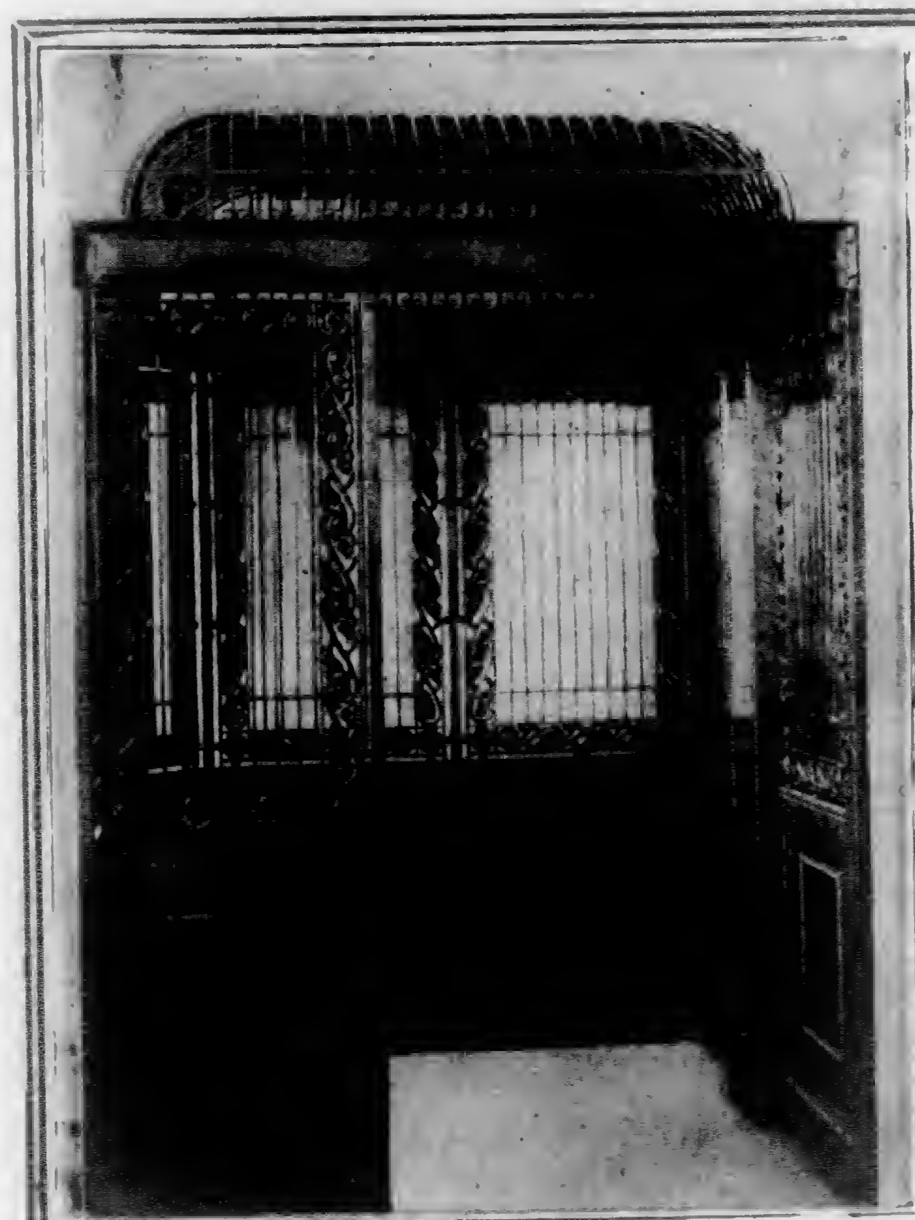
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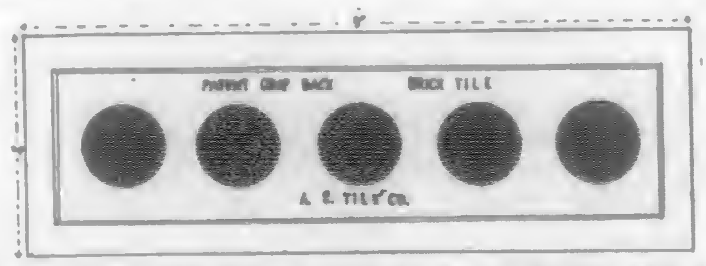
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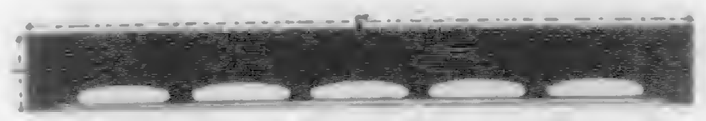
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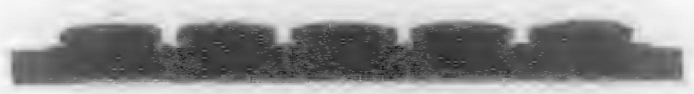


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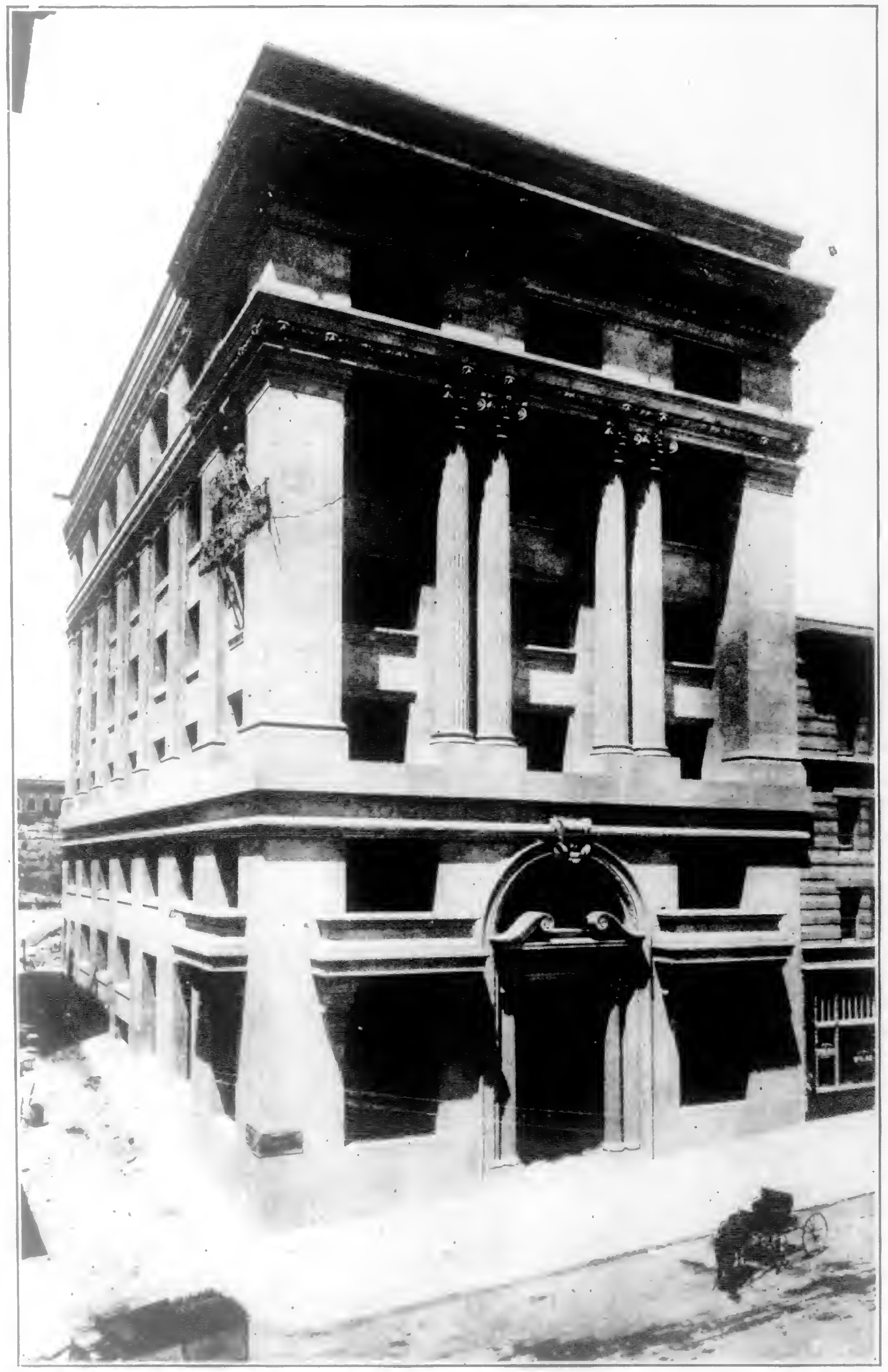
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Contents for August



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Coxhead & Coxhead, Architects

Frontispiece,
The Architect and Engineer of California
August, 1909

THE

Architect and Engineer

Of California

Pacific Coast States

VOL. XVIII. AUGUST, 1909. No. 1.

The Telephone Exchange

By ALMERIC COXHEAD, Architect.

FIVE years ago, or less, even, the present extent of telephone service was not dreamed of, and but slight opportunity for growth was provided in the exchange. To-day, while we see a marvelous transformation, it must be admitted that but a fraction of the ultimate is developed. The planning of a modern telephone exchange falls to the lot of only a few practitioners, but the problem is, nevertheless, most interesting to the profession as a whole. Writing along these lines in a recent article on the telephone exchange, Architect Irving K. Pond says:

"But few architects are called upon to consider the problem, and while a great public is served from within these structures this public does not make that direct personal use of the telephone exchange that it does of the office building, the penitentiary or the theater. In fact, the telephone exchange bears about the same relationship to the generality of public buildings as does the stage of the theater to the auditorium, or, more correctly, as the mysterious portion back of the footlights, with its traps, its galleries, its bridges, its gridiron, its rigging, its dressing rooms, property and scene rooms, bears to the front, with its gay proscenium, its sumptuous loges, broad foyers and stairways and its resplendent decorations."

Russell Sturgis places the telephone exchange in the factory and warehouse class, and severely criticises architectural embellishment of the exchange building, believing such embellishment out of place in a utilitarian structure.

It is easy to set up a dummy of straw and then knock it down. Many distinguished architects take exception to Mr. Sturgis' contention, among them Mr. Pond, whose position seems well taken in the following paragraph:

"It is not so easy to tell just how far to carry ornamentation in any kind of a structure, utilitarian or otherwise. But the telephone exchange partakes of the nature of an office (in no sense a shop or factory) building and of a club of girls, and such being the case I do not believe ornament or the elements of beauty and domesticity are likely to be carried to a fatal extreme. It is not the function of the play of color or of the bits of carving about the entrances or of the bright flowers on the window ledges to command 'abandon hope all who enter here,' but rather the function is to invite to labor, 'Come, work, rest, recreate and work again amid pleasant surroundings, and enjoy at least a bit of the beauty to which your work entitles you.' "

In San Francisco, since the great fire of 1906, the tendency has been to build well, and the telephone companies have been doing their part in pro-



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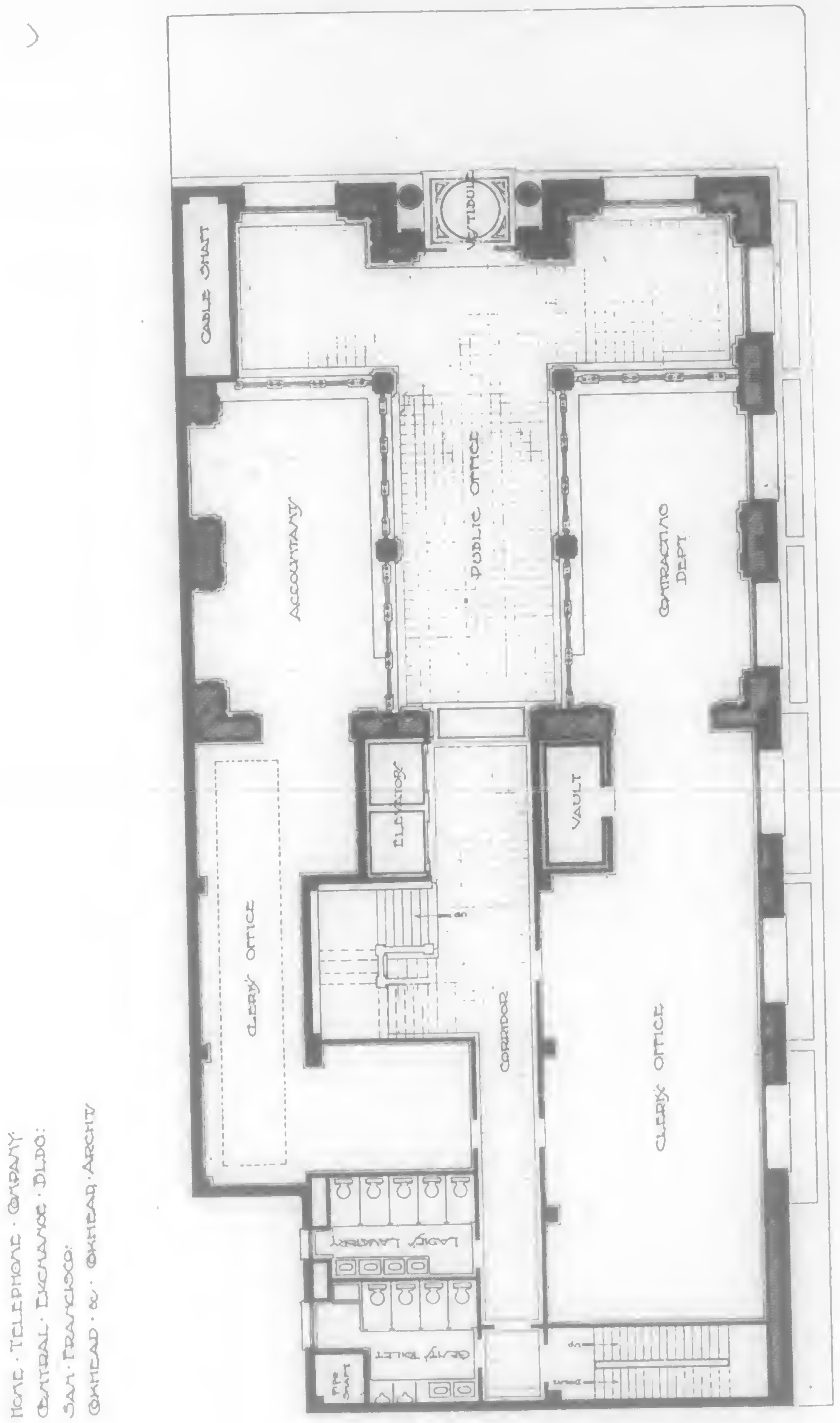
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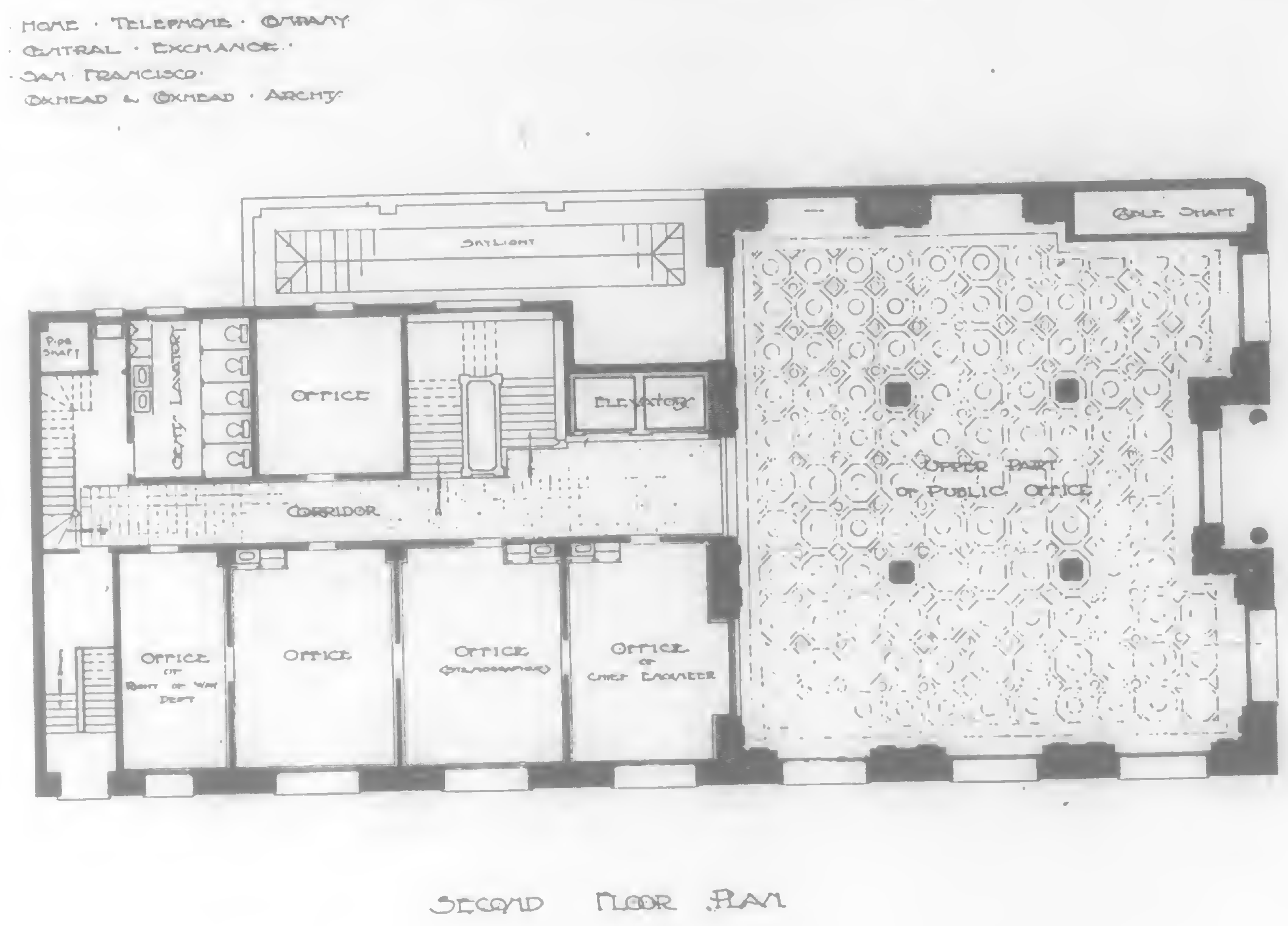
Main Office Building, Home Telephone Company, San Francisco



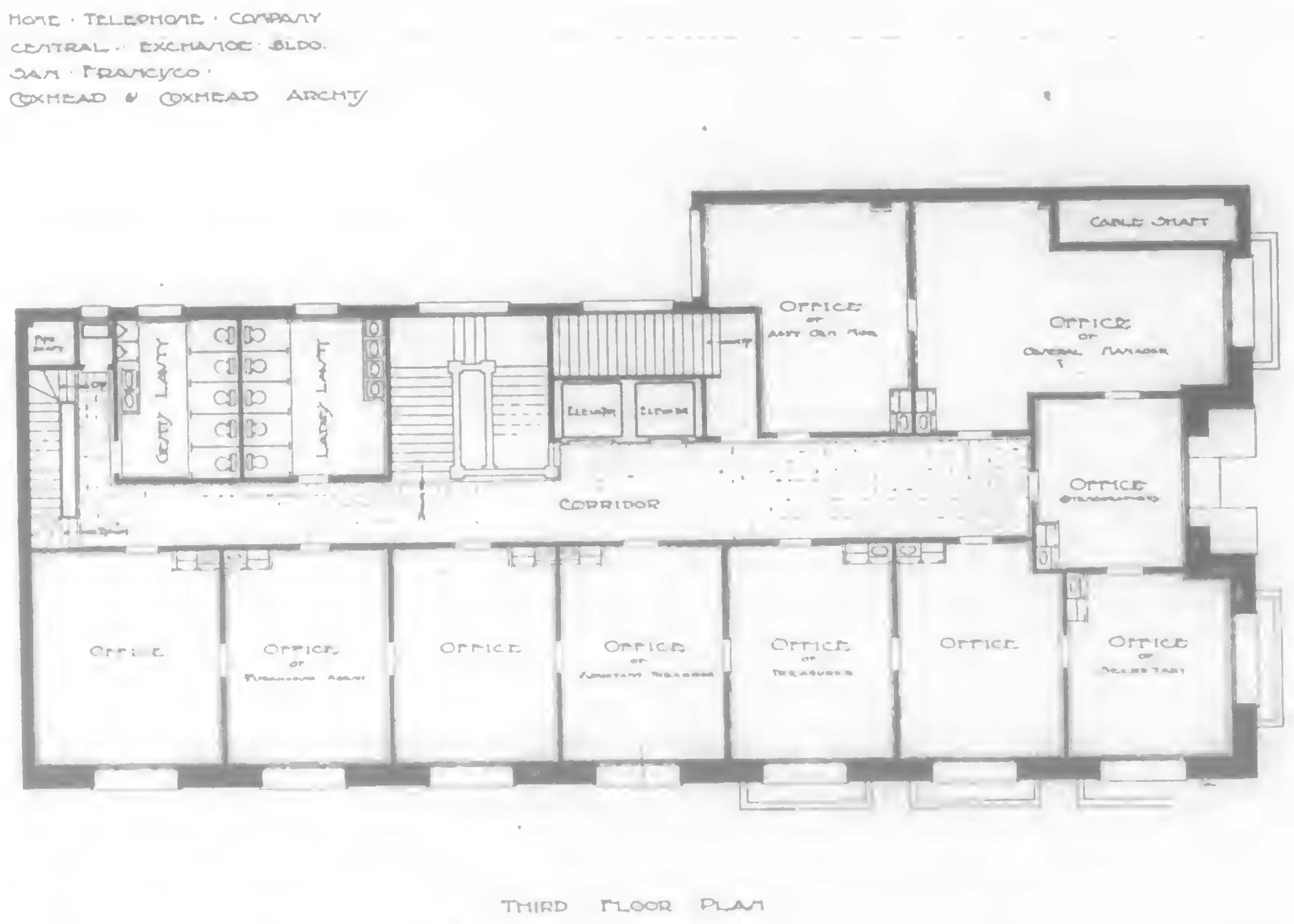
Detail of Entrance, Main Office, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects

viding structures that are not only substantial but ornate. In its buildings the Home Telephone Company has sought to give the public the best that money and skill affords. There has been no stint of funds or skimping of materials. One style of architecture—the classic—has been followed, to a degree, in all the buildings, and the result is a group of buildings, each in perfect harmony with the other, and conspicuous for the unmistakable atmosphere of strength and massiveness which surrounds them.

In three years the company has erected buildings in all parts of San Francisco as well as in Oakland and Berkeley, and plans are under way for other buildings to be erected during the present year. The main exchange building is on Grant avenue, just north of Sutter street, and is built of Colusa sandstone upon a steel frame. This structure has attracted unusual



Main Office Building, Home Telephone Company, San Francisco



Main Office Building, Home Telephone Company, San Francisco



Detail of Elevator Enclosure, Main Office Building, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects

attention, and it is worthy of note that the design expresses a unity of purpose for which the building is to be used. Buildings of one or two stories, for a single purpose, are not uncommon, but where seven or eight stories are embodied they are almost unique.

The entrance is in the center of the facade on Grant avenue and opens into the lobby or public space, which has the appearance of a large banking room. This will be used by the public and the contract and accounting departments of the company; telephone booths and writing tables will also be provided for the use of the company's subscribers.

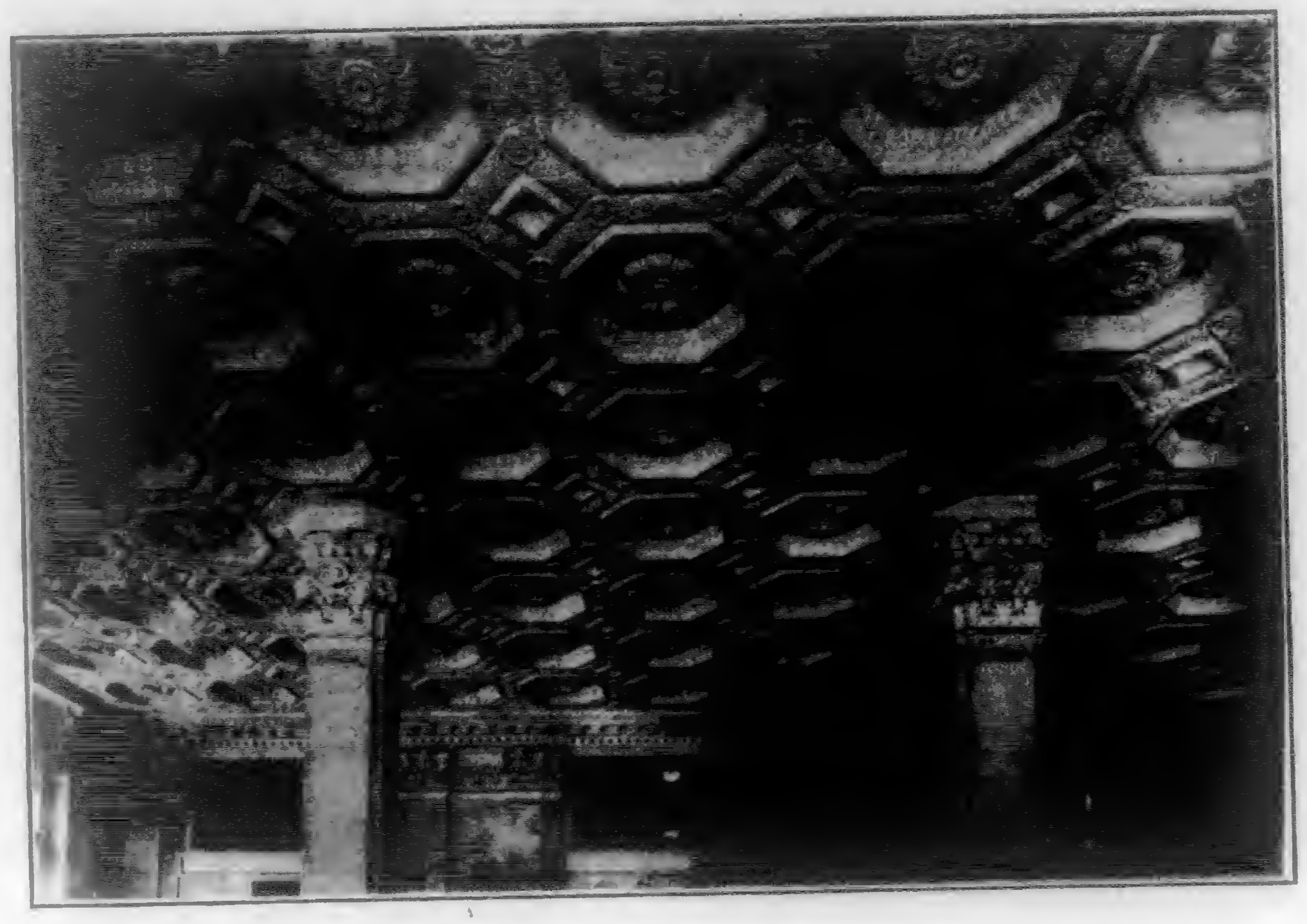
The public lobby measures 66 by 66.9 feet in floor area, and in height is two full stories with coffuired ceiling, which is an exceptionally nice piece



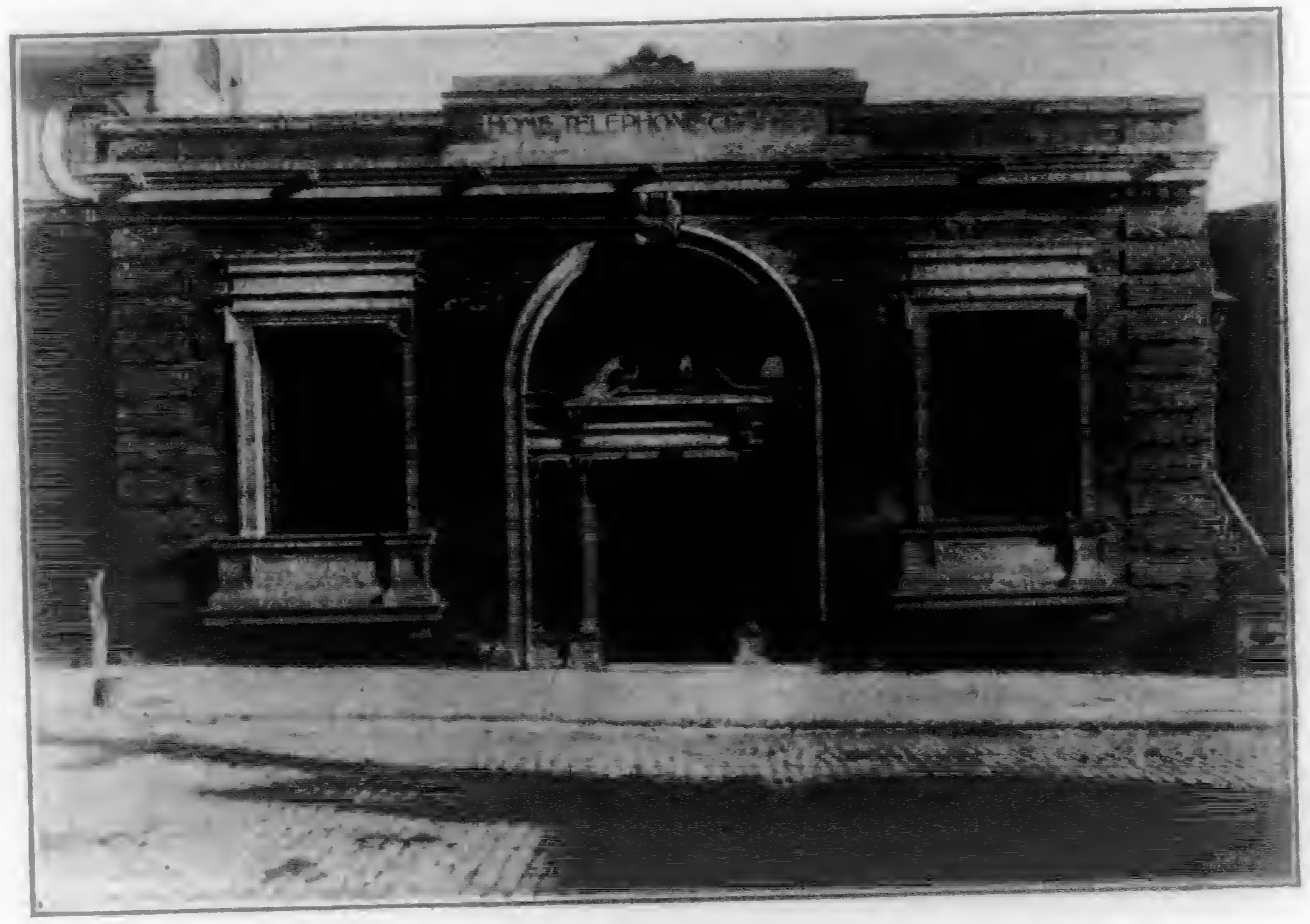
Detail of Columns and Cornice, Main Office, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects

of work, and in perfect harmony with the architectural scheme of the building, in the Italian Renaissance style. The marble counters and screen work to the public lobby are now being executed. As the entire building is to be used by the Home Telephone Company no separate entrance is necessary to reach the administration office on the second and third floors. A spacious staircase and two elevators are provided at the farther end of the public office. A separate staircase at the extreme rear, and cut off from other portions of the building, with exit on Harlam Place, is provided for the use of electricians and other mechanics who may have work on the fourth, fifth, sixth and seventh floors.

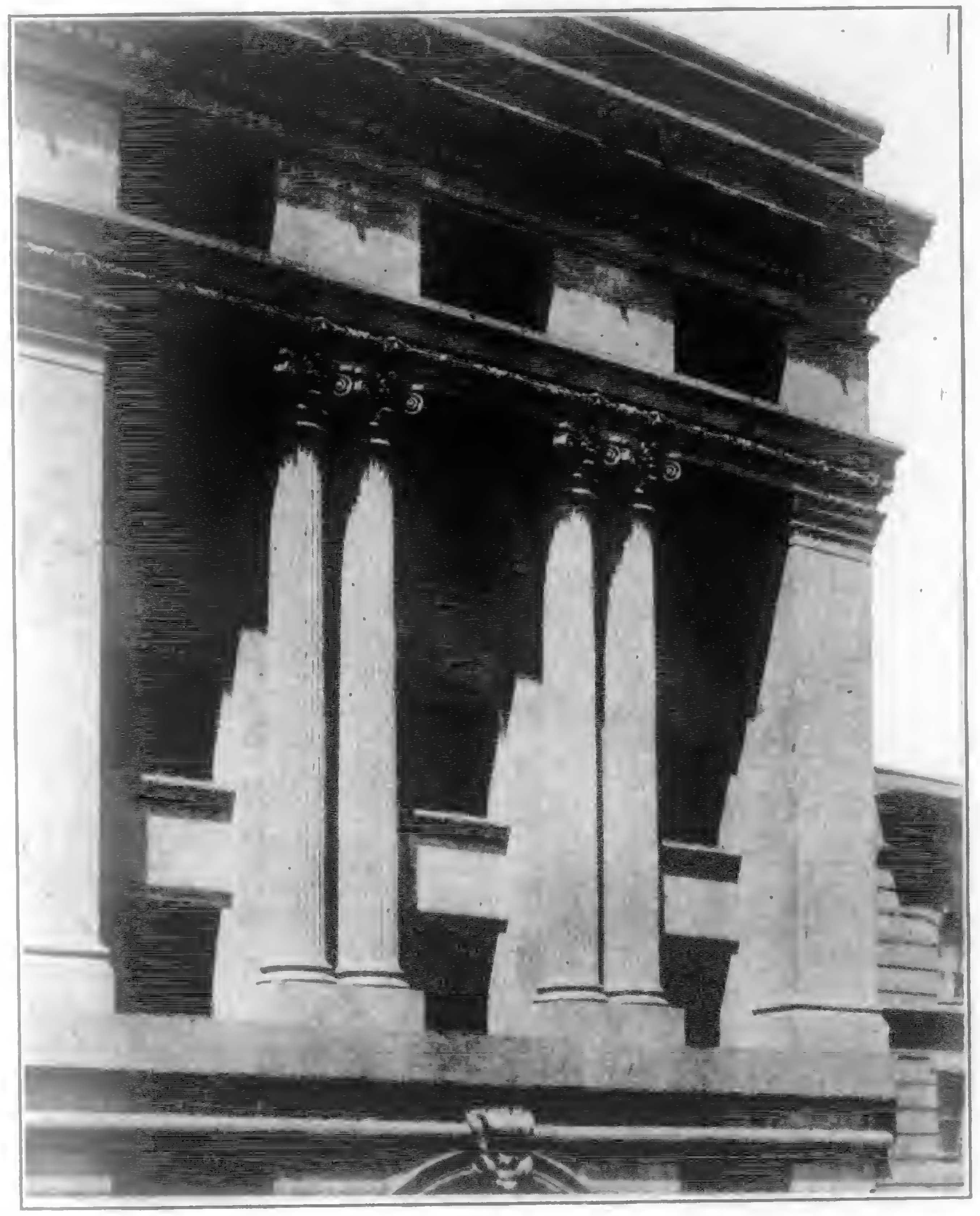
All the floors above the administration offices are devoted to the operating department, these stories being spanned with heavy thirty-six inch plate girders to give clear space for the automatic equipment now being installed. On the seventh floor the instruments are already in place and service is being given to subscribers in the city.



Detail of Ceiling, Main Office, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects



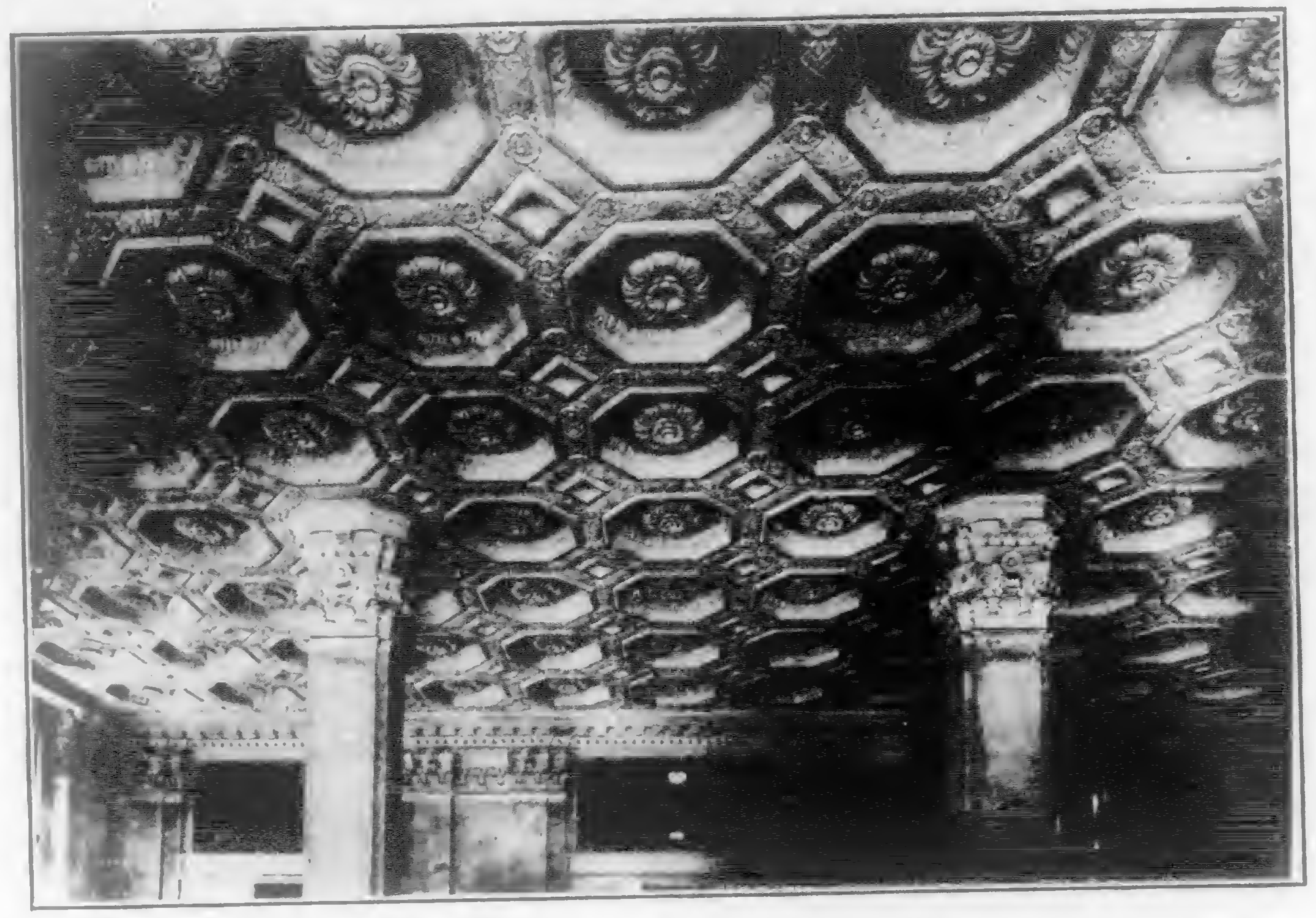
Telephone Building, Bush Street, near Fillmore, San Francisco
Coxhead & Coxhead, Architects



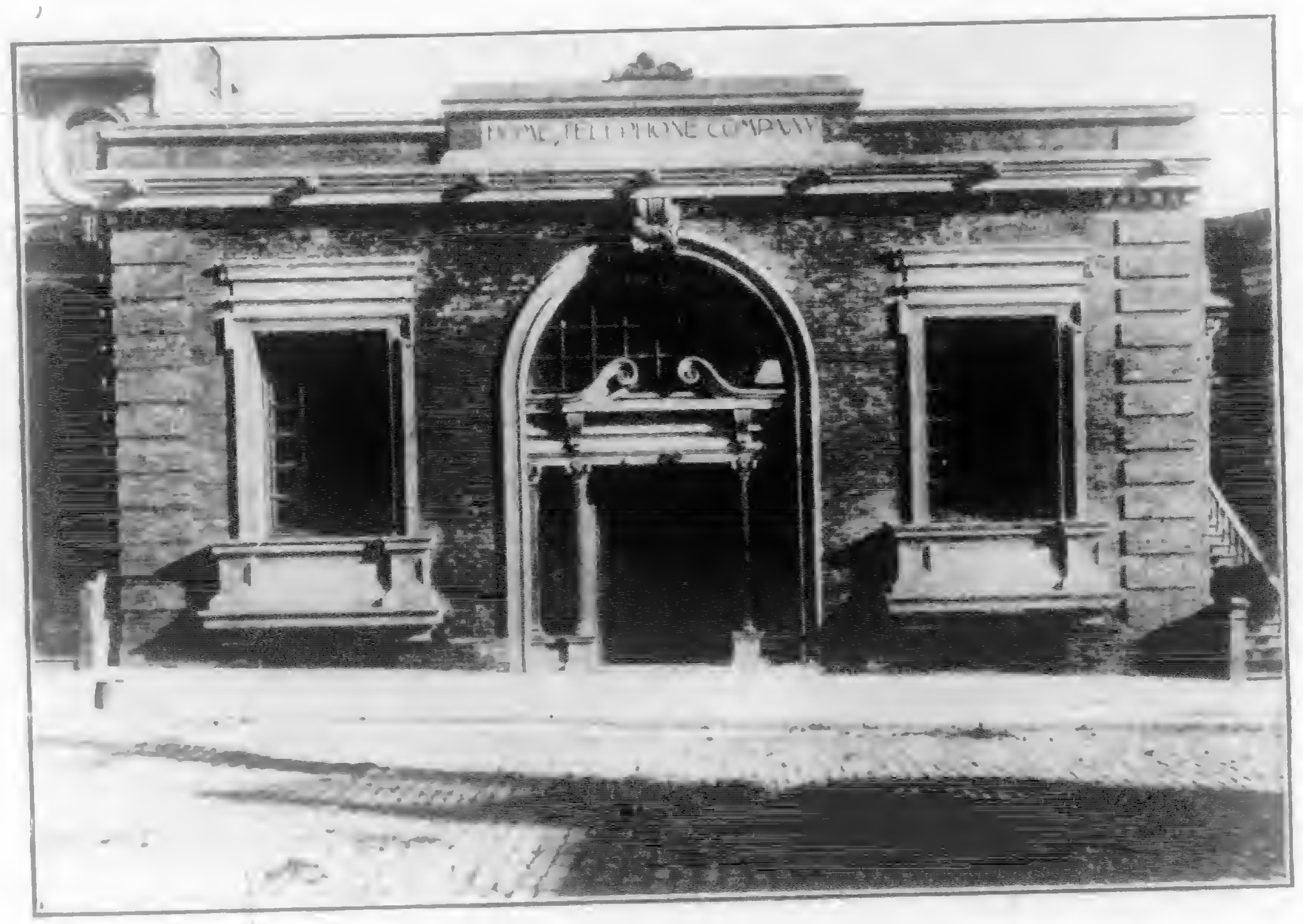
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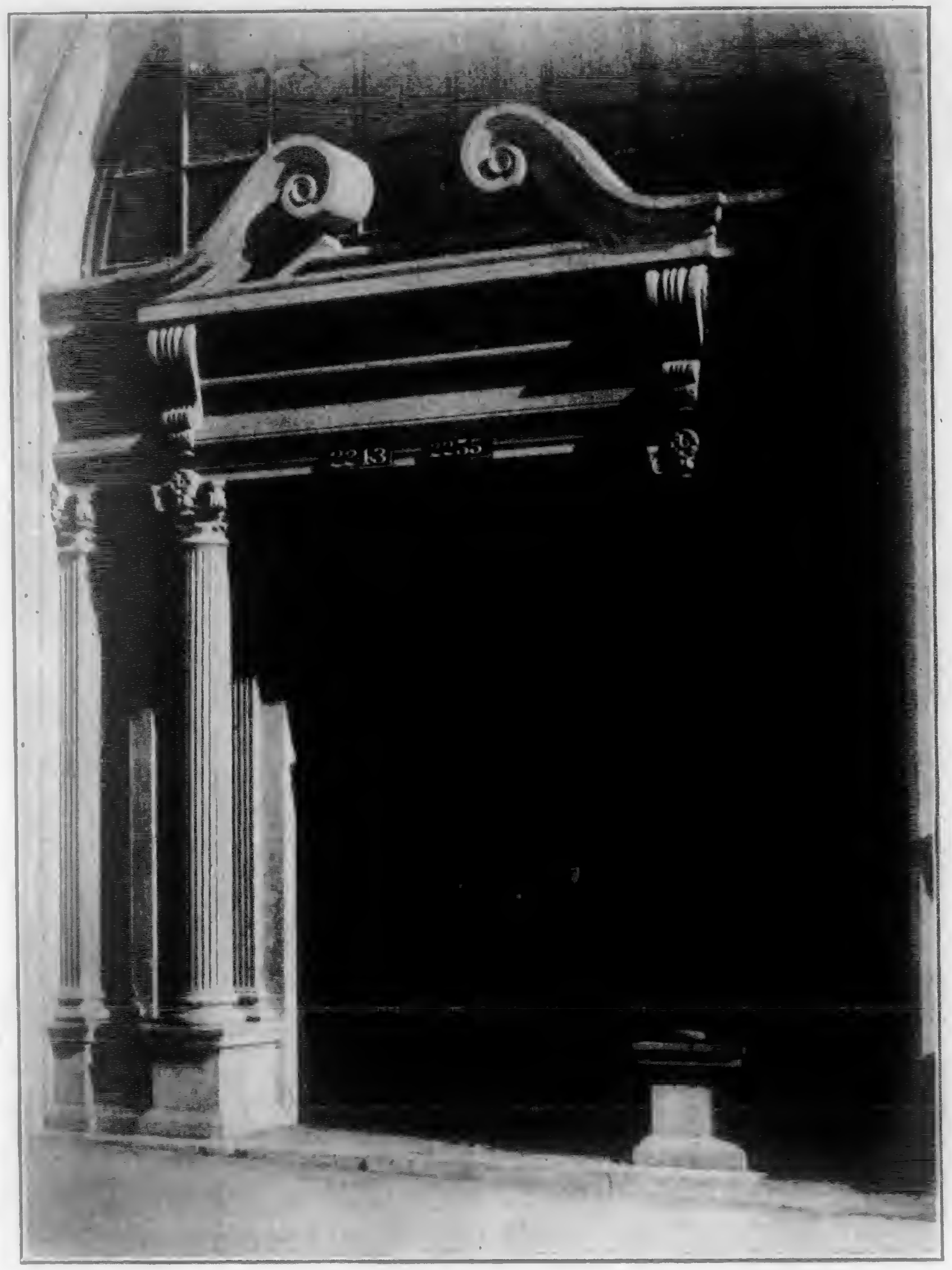
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Detail of Ceiling, Main Office, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects



Telephone Building, Bush Street, near Fillmore, San Francisco
Coxhead & Coxhead, Architects



Detail of Entrance, Telephone Building, Bush Street, near Fillmore, San Francisco
Coxhead & Coxhead, Architects

All the interior wall partitions are of porous terra cotta, this being considered the most fire-proof material that could be used and the finish of these walls in the public hallways are of marble. The building is ventilated by a mechanical system of ventilation.

A Corinthian order the entire height of the building is used on the facade and the massiveness with which this order has been rendered can be fully realized only when it is understood that the building is eight stories in height. The grouped free columns which the architects have employed give strength both to the design and work.

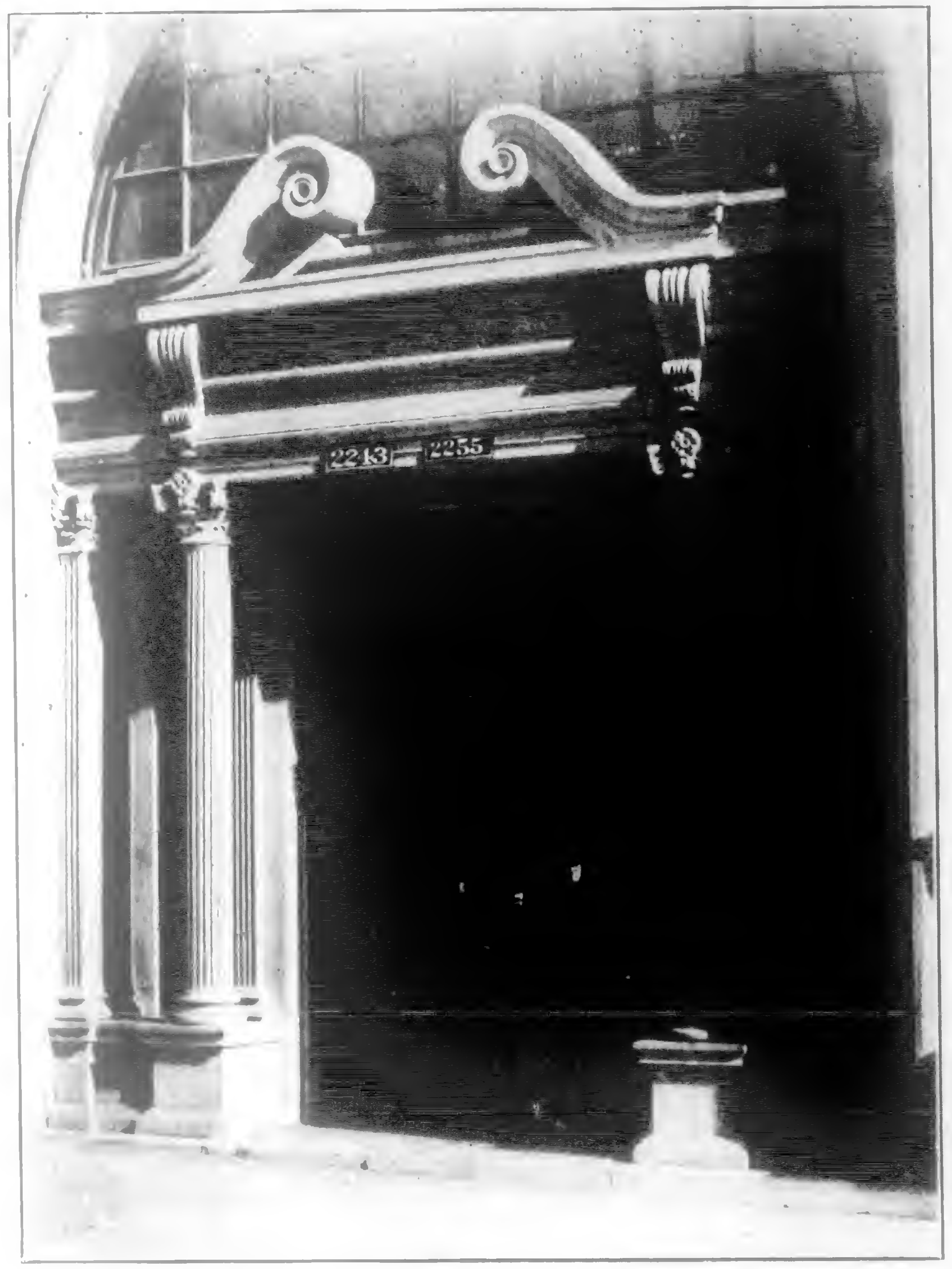
The building on Howard street is a three-story and basement, re-



Berkeley Building, Home Telephone Company
Coxhead & Coxhead, Architects



Telephone Building, Seventeenth and Albion Streets, San Francisco
Coxhead & Coxhead, Architects



[illegible] of Entrance, Telephone Building, Bush Street, near Fillmore, San Francisco
Coxhead & Coxhead, Architects

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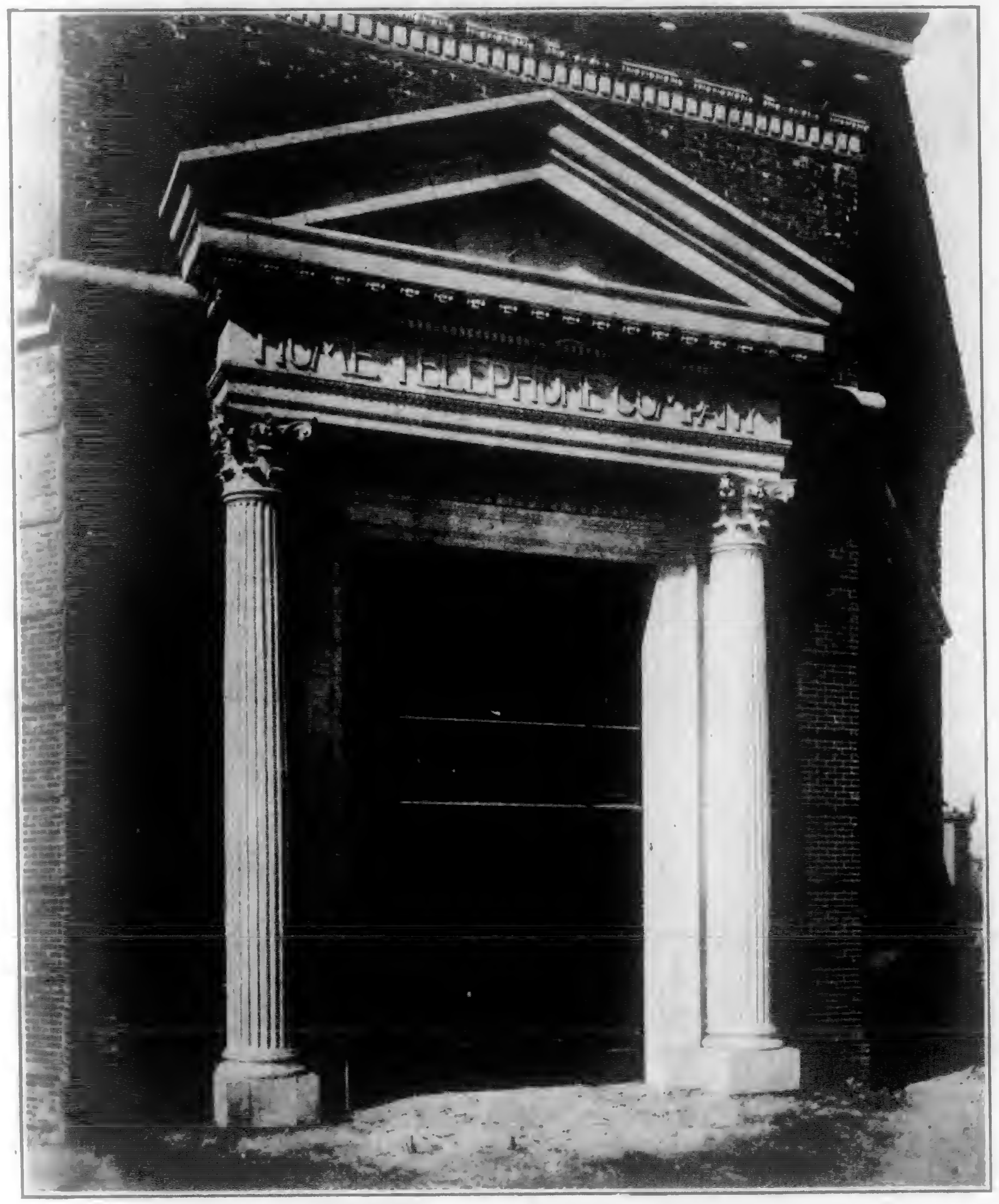
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Berkeley Building, Home Telephone Company
Coxhead & Coxhead, Architects



Telephone Building, Seventeenth and Albion Streets, San Francisco
Coxhead & Coxhead, Architects



Detail of Entrance and Cornice, Telephone Building, Berkeley
Coxhead & Coxhead, Architects

inforced concrete structure with a frontage on Howard street of 55 feet and extending through to Tehama street in the rear.

The Howard street front is of Colusa sandstone. The first story of this building is used by the company as a warehouse and the two upper floors are used for the switch, power and battery rooms for the automatic service in that district.

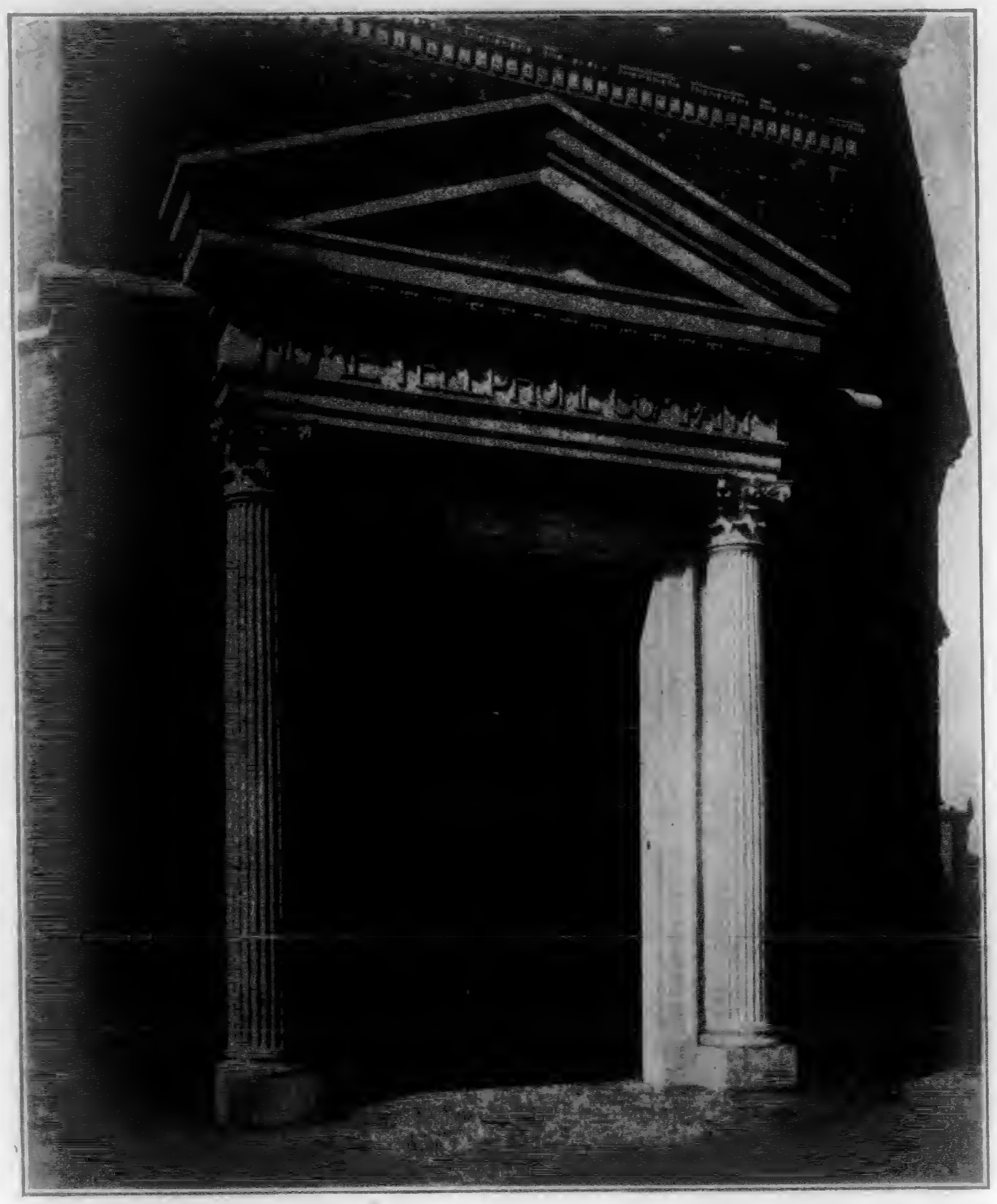
On the south side of Bush street, near Fillmore street, and on the northeast corner of Albion and Seventeenth streets, near Valencia street, the company has erected two two-story, fire-proof buildings for the equipment and maintenance of telephone service in these districts. Each of these



Detail of Entrance, Telephone Building, Seventeenth and Albion Streets, San Francisco
Coxhead & Coxhead, Architects

buildings are now complete and cover an area of 60 by 100 feet. The entrances to these buildings have been made strong features in the designs and are built of sandstone. The exterior walls are of dark red brick and the interior walls are of porous hollow terra cotta.

The Berkeley Home Telephone building is also a Class A building and is a three-story structure erected upon a lot 80 by 90 feet, on the corner of Milvia and Allston Way, within one block of the City hall. In its appointments it is planned similar to the main building in San Francisco, having general offices and power and battery rooms on the first floor with large equipment and switch rooms above. The enriched cornice and main entrance to this building is of terra cotta and the face work of the walls of a dark red brick.

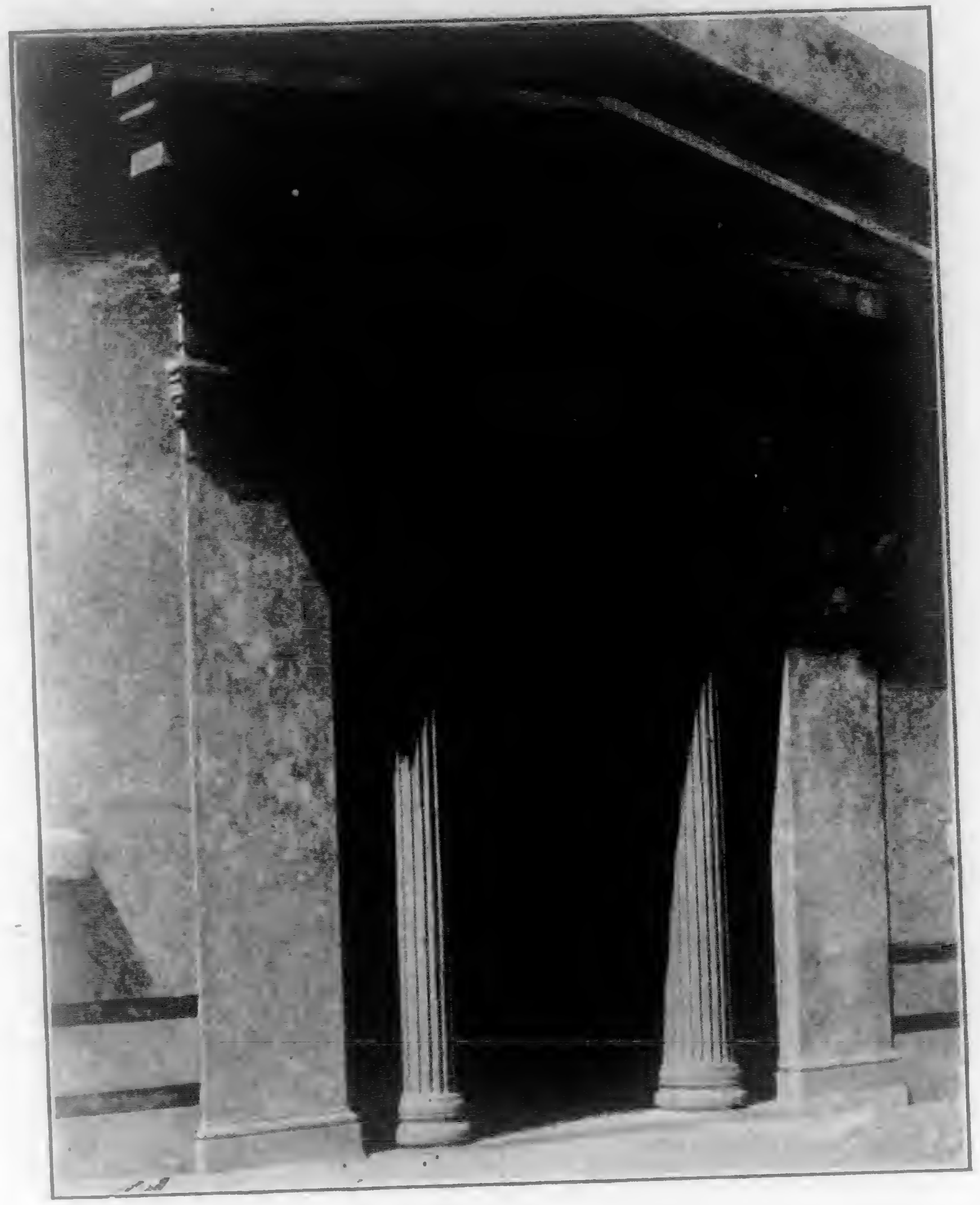


Detail of Entrance and Cornice, Telephone Building, Berkeley
Coxhead & Coxhead, Architects

inforced concrete structure with a frontage on Howard street of 55 feet and extending through to Tehama street in the rear.

The Howard street front is of Colusa sandstone. The first story of this building is used by the company as a warehouse and the two upper floors are used for the switch, power and battery rooms for the automatic service in that district.

On the south side of Bush street, near Fillmore street, and on the northeast corner of Albion and Seventeenth streets, near Valencia street, the company has erected two two-story, fire-proof buildings for the equipment and maintenance of telephone service in these districts. Each of these



Detail of Entrance, Telephone Building, Seventeenth and Albion Streets, San Francisco
Coxhead & Coxhead, Architects

buildings are now complete and cover an area of 60 by 100 feet. The entrances to these buildings have been made strong features in the designs and are built of sandstone. The exterior walls are of dark red brick and the interior walls are of porous hollow terra cotta.

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Howard Street Building, Home Telephone Company, San Francisco
Coxhead & Coxhead, Architects

The Cook's Prayer

An old tale of Cardinal Manning. The great ecclesiastic's appearance was so ascetic that he seemed to have been almost starved. Once in Liverpool he visited a convent, and the cook knelt to him for a blessing, which she got.

"May the Lord preserve your Eminence," said she; and then, looking at his thin face, she added, "And, oh, may God forgive your cook!"

The taxicab is far too square
To overtax the taxi-fare;
But who is brave enough to skip,
The taxi-cabby's taxi-tip?

About Competitions

By FRANCIS XAVIER LOURDOU, Architect*

MUNICIPALITIES and private institutions are frequently calling for competitive designs, and the rules governing these contests have often been to the writer an object of surprise, owing to the carelessness or the bad faith displayed in their preparation.

Oftentimes municipalities ignore competition altogether, and when they want to erect some building, they simply entrust with the work some local architect of their own selection. In this case, political considerations are, of course, the prime mover in the transaction. We also not uncommonly see a Board of Supervisors advertise for competitive designs with a prescribed delay for delivery, barely equal to one-fifth or one-tenth the time actually required to prepare complete plans and estimates.

Why is that?

Because there is underhand an already designated architect who has previously prepared the entire work, and to whom it is desired, for some reason to award its execution.

Another time, a municipality offers ridiculous prices, $50, $40, $30. for instance, while the importance of the work would warrant a tenfold increase of those figures. But this is done for the purpose of scaring away the largest possible number of competitors, and of leaving a free hand to the already selected party, be his plans good or bad.

In still another instance the clauses are such as to offer no guarantee to the competitors, who give up the attempt in disgust, the very object aimed at by those who prepared the program.

All that is wrong, unfair and unworthy of a great and free democratic country.

The writer is inclined to believe that this magazine could accomplish a great deal by frequently taking up the subject of competitions and by criticizing in one form or another, dishonest contests which would be pointed out by architects. On political grounds there is much to be done. All municipalities should be compelled to call for competitive proposals in at least two-thirds of the proposed works. In other words, competitions ought to be treated like ordinary work, viz., awarded either to the lowest, or to the most trustworthy bidder, on the ground of guarantee of successful execution.

It may be objected that municipalities who are contemplating important constructions require special guarantees of practical experience and knowledge, and that in consequence they may select men properly qualified in these respects in preference to any others. In such a case, the oldest local architect in good standing, ought to be chosen, since his experience is more extensive. As to special knowledge and executive ability, everybody knows that even architects of long standing are frequently resorting to the assistance of engineers or of special designers to carry out the work entrusted with them. We all know of some architects who never wielded a pencil nor served any serious apprenticeship, and who are nevertheless placed in charge of important work by either public or private institutions. So that whatever excuse may be offered for the before-hand selection of an architect, is untrue in principle. Competition alone will always be demanded by self-confident architects who know their business. Those who do not, will not try.

*910 Wright & Callendar Building, Los Angeles.

The following basis for a proper competition is here suggested:

1. All certificated architects, either local or in the county, or in the state, according to the importance of the work, should be called upon to compete.

2. The time allowed for delivery of the competition designs should always be governed by the importance of the works and reasonably adequate.

3. Prices should be clearly defined, and in proportion to the importance of the work (that is to say from one per cent to one and one-half per cent of the amount specified for the second, third, etc. classed designs—the first prize awarded with the execution.)

4. Competition should be secret, and one architect appointed by the local chapter should attend the award of prizes, and particularly the opening of sealed proposals bearing the names of the competitors.

5. The clauses of the competitions should be approved by the board of architecture of the city, county or state, according to the importance of the work.

6. In case the successful competitor should be a young architect, lacking extensive practice, he would have to be assisted by an experienced superintendent of works, whose compensation he would have to provide under specified conditions.

These rules are accepted and followed in democratic countries of Europe, and also in some South American countries, where they lead to excellent results. In Paris, for instance, not only are the competitions between architects correctly conducted, but they are extended to the property owners. The city distributes annually $100,000 to the ten of those who have erected the handsomest street apartments, hotels or residences. The prizes are awarded by an appointed committee of architects, of engineers and of artists.

And since, the architect has a common interest with the property owner, the city of Paris is yearly embellished by artistic and original structures. The outcome is, besides, keen emulation between the architects, the construction companies, etc., that the public wealth has the benefit of it.

When shall we witness such results in this great and free America, where all is more possible than elsewhere, because not handicapped by ancient laws, old conditions and customs, or by excessive partitioning of the property?

The boards of architecture, the artistic architectural clubs and other societies could do a great deal toward that result. They might, for instance, have printed circulars distributed yearly among municipalities, laying down the rules to be followed in case of competitive contests. Justice, which applies to individuals, should likewise reach the groups of individuals who are bidding for public wealth and confidence.

In this country where men are very broad minded—when they have to create or build things, they must be very broad, too, on the democratical principle of everything. Then the result of these competitions would, besides arouse the interest of the community, which in all large cities is admitted to inspect the prized plans. A refinement of artistic taste would ensue and practical usefulness would gradually make a little more room for esthetics to its decided advantage.

As a rule, we are of a practical turn of mind. It is far easier for an architect, be he "a Prix de Rome" to merely design a business block in the shape of a wooden box, without ornaments or mouldings, than to be racking his brains in the solution of a more or less hopeless riddle propounded by a client, in the shape of inadequate credits entirely out of

proportion with the necessary outlay, and in spite of that, what architect does not strive to do good and decent work?

The ultimate object is to educate the public to sacrifice mere usefulness to art, and it will never learn it, unless it is shown what to do and how to do it. Art clashes with practice; a plain square pillar is easier to make than a round, carved column, and yet we like to surround ourselves with at least some little art. And so the architects must lead the public movement in construction, just as municipalities must lead architects in decorating their cities.

So keenly had Colonel Roosevelt appreciated the necessity of guiding the public mind in that direction, that he had appointed a commission to act all over the United States. In such a large country, artistic feeling left to itself, is bound to run astray and a few great American architects had attempted to lead a campaign against that recklessness of public taste.

The writer is aware that a serious obstacle exists to that program, namely, the cosmopolite origin or nature of the population. The Anglo Saxon always will demand gothic, the French, Renaissance, the Italian, lace carving, and so on. All of these are good if properly selected and applied. This is but one more reason why public opinion should be purified, confined and directed; otherwise confusion must surely ensue, and America will never find any national style which she strives to create or to have.

* * *

And now to revert to our starting point: "Competitions—many of them—and Justice, too." Of all states in the Union, California is best adapted to refined architecture. It offers the greatest facilities to the art of construction, but if artistic development is to follow its regular and upward progress, justice must protect it; all obstructions must fall before it—and above all, the ideals, the aspirations, the vigor of the young must keep pace with the experience and the taste of their elders. The old school and the young one must always complete each other. In no other way will that combination be reached, of Beauty, Truth and Usefulness.

* * *

Reinforced Concrete Cisterns Do Not Leak

Harris H. D. Connick, chief assistant to the City Engineer, San Francisco, states that the report that several of the new cisterns built in connection with the auxiliary fire system had been found to be of such faulty construction that they would not hold water, and therefore could not be accepted by the city, was apparently based on an entire misconception of the facts.

The cisterns in question are not finished and are being tested by the contractors, not by the city, that any leaks existing may be located and remedied before the work is offered to the city for acceptance. All were found to be in excellent shape, the leakage of from four to six feet, of which mention was made, being from the space above the "ingress pipe," which space is not to hold water at all when the cisterns are in actual use. The pipe in question is set loosely in the concrete wall, that breakage may be avoided in case of earthquake.

So far as the space designed to hold the 75,000 gallons of water provided for was concerned, all of the cisterns were found to be perfectly tight. The Healy-Tibbetts Construction Company are contractors of most of the cisterns nearing completion.

Everything All Right, But---

THE late depression we have had in the financial world caused a friend of mine to be much worried. He went to his physician, who advised him to take a rest.

"Now, Charlie," he said, "you must stop smoking and excitement of all kinds; in fact, you must keep yourself entirely by yourself; receive no mail, read no letters and get no news from the outside world. Go away, sir, for a month."

My friend did this and was much improved. Returning home he met his butler at the station and said:

"James, how is everything? All right?

"Yes, sir; everything is all right, sir. Purty good"—

"Anything happen while I was away?"

"No, sir; everything is all right—except your dog, sir."

"My dog?"

"Your dog, sir."

"What's happened to him?"

"He's dead"—

"Dead?"

"Yes, sir."

"What did he die of?"

"I don't know, sir. I think is was from eating burnt horse flesh, sir."

"Burnt horse flesh? Why, how did that happen?"

"Well, I don't know, sir. I think it was from the barn, sir."

"The barn?"

"Yes, sir. The barn burned down, sir."

"Why, how did that happen?"

"Well, you see, sir, I think it was from the sparks from the house"—

"What house?"

"Why your house. It burned down, sir."

"What! My house burned down? Why, how did that catch fire?"

"I don't know exactly. I think it was from the curtains in the windows"—

"Why, how did they catch fire?"

"Well, I don't know. I think they must have caught fire from the candles."

"What candles? We haven't any candles in our house. We use nothing but electricity and gas."

"I know, sir. But the candles were all around the coffin"—

"The coffin? Why, who's dead?"

"Oh, nobody but your mother-in-law, sir."

"My mother-in-law?"

"Yes, sir."

"How did she die?"

"I don't know, sir, but I think is was from the shock."

"The shock?"

"Yes, sir."

"What shock?"

"Well, you see—your wife ran away with the coachman."—Marshall P. Wilder in "The Circle."

She who loves and runs away may be sorry later on.

Tunneling Into San Francisco

By F. W. FITZPATRICK, Architect.

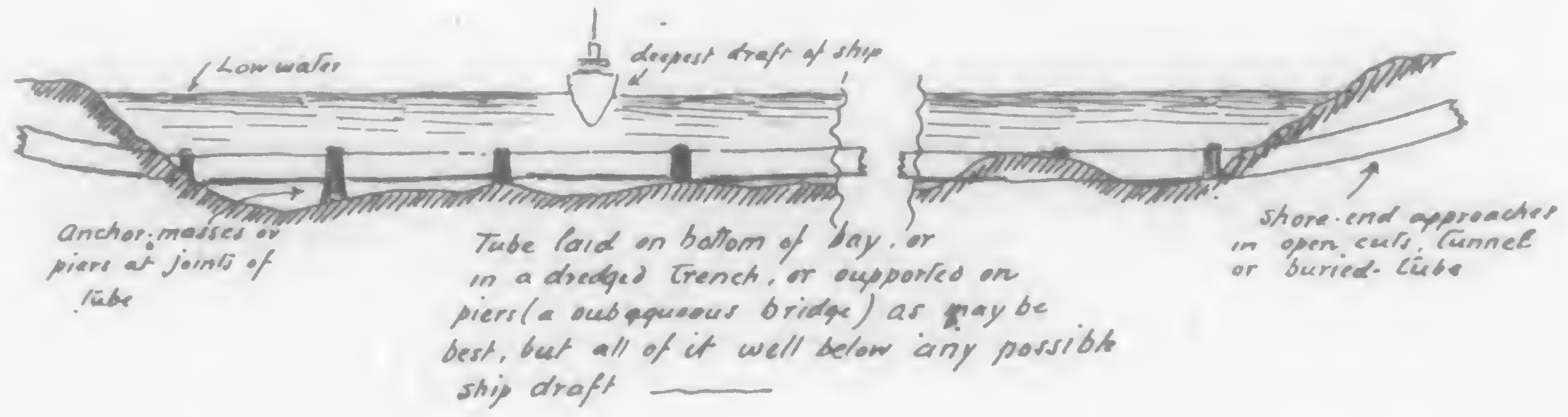
THE article on this subject by Mr. F. T. Newberry in a recent issue of The Architect and Engineer was most interesting, and particularly to me because it is a revival of a project that was set afoot some years ago and with which I had much to do. Some water company there in California was back of the affair, but it couldn't raise the capital or something or other happened. Anyway, the matter was dropped and I had not thought of it again until I saw Mr. Newberry's paper.

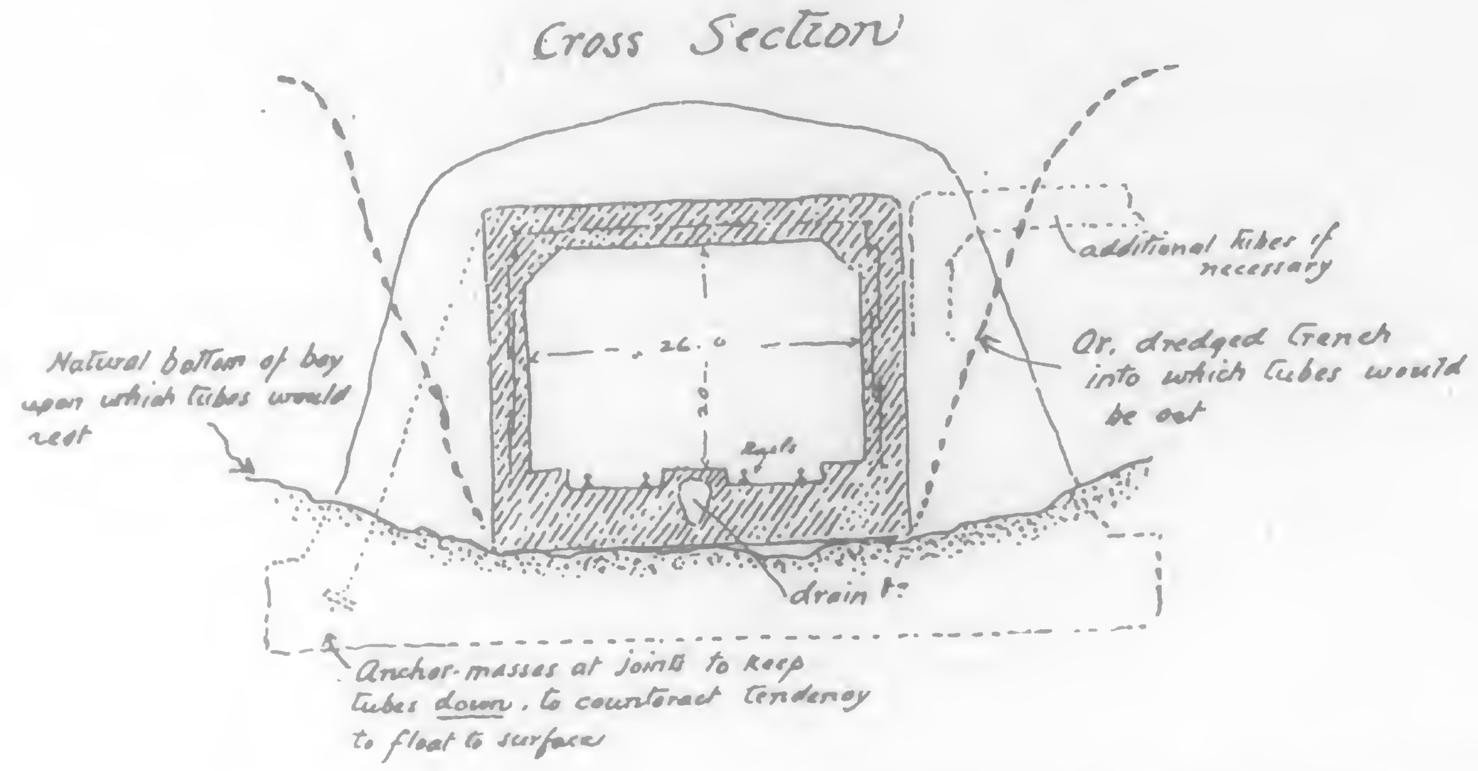
It seems to me, however, that that gentleman is a wee bit off in his estimates. If he can build five miles of an excavated tunnel for $2,500,000 he will accomplish something that has never yet been done. In tunnel work there are always contingencies arising that never confront one in ordinary construction and you Californians will be lucky indeed, if you ever get a tunnel, as badly as you need one, for twice what Mr. Newberry calculates.

The scheme we contemplated was based upon American patents that I control and for a system of tunneling that is being considered now in St. Louis and several other American points, but that has not yet been actually installed here, though it is in successful operation under the Seine at Paris. Leading engineers, however, concede that while novel, almost revolutionary, it is absolutely practicable and is the least costly of sub-aqueous construction, much less costly than excavated or shield work tunneling.

Briefly described, the tunnel is really a subaqueous bridge. It was fully illustrated in the Engineering News and the Scientific American a couple of years ago and attracted much attention in engineering circles. I plan to build square tubes of reinforced concrete, tubes 26 feet wide and 20 feet high and 100 feet long. It is unnecessary to go into the reinforcing system, but the sides are virtually great trusses 100 feet long, of about 24-inch thick concrete thoroughly embedding the reinforcement and completely covered with water-proofing and properly lined with damp repellant furring. These tubes to be made at any convenient point on land, the ends temporarily bulkheaded and the tube towed out in calm weather to about its proper position. There the bulkheads are removed, the tube filled with water and sinks. The bottom of the stream or bay or river is previously prepared, either simply smoothed off or trenched by means of the ordinary dredge. Guide piles are driven and after the section of the tube is properly placed on the bottom, a jointing caisson is towed to its end, covers the end and its juncture is made with the land portion of the tunnel or with a previously laid section of tube. A new section is towed out and jointed to this last in the same

Crossing Diagram





manner and so on until the whole is completed. The joints are bolted and fastened together and then concreted with a great mass of concrete just about in the same fashion as street car rails used to be welded together in place a few years ago. All the excavation or dredging that is necessary is in shallow places so as to insure that the top of the tunnel is well below navigation. Apart from that one consideration of leaving free way for vessels, the tubes are virtually laid upon the bed of the stream or bay. When the entire length of tube is laid and joins the land's ends or open cuts the water is pumped out and there's the whole thing complete and ready for laying of rails, installation of syphon drains, ventilation, electric lights and so on.

It is simplicity itself and the one in Paris was built and completed in a most extraordinary short time. I got my notion of this from the building of the old "whaleback" vessels on Lake Superior some fifteen years or so ago, another scheme in which I took a deep interest and that was called by the over-conservatives a wild-eyed dream, though it has proven itself a splendid reality.

This species of submarine bridge is a complete entity in each double-track run. If traffic increases, all there is to do is to lay another tube alongside of the old one and so on ad infinitum. Unlike other bridges, there is no stopping of traffic to make the necessary additions, changes, etc.

The details of reinforcement, stresses and all that sort of thing were worked out by Mr. F. W. Lepper, C. E., a well-known U. S. Government Engineer now in charge of the Government work in Cleveland and who was with me and did all the figuring and engineering work on the steel framing of the huge Government Building at Chicago.

Incidentally this scheme was suggested by me to the Pennsylvania Railway people for their tunnels at New York. They had already gotten too far along with their plans for the bored, shield system however, and deemed this too revolutionary to try there. They have encountered great difficulty in their boring and the work has cost enormously and I have heard upon very good authority that the powers that be are kicking themselves now that they didn't adopt the scheme that was presented to them then; in this case I think I am far enough in the van that you San Francisco people need not have to say later on that they wished they had known about it before.



Ceramic Tile Decorations for Concrete Surfaces

The Decoration of Concrete Buildings and Their Surroundings

By WALTER MUELLER, in Cement Age.

THOSE applications of concrete that are most frequently encountered and largely responsible for the public's familiarity with this material, but by which it undoubtedly, to a considerable extent, judges the scope of concrete's applicability, are mainly of a utilitarian character. They are naturally designed to fulfill a certain practical—often intensely so—purpose and for that reason, apparently, it has been deemed necessary by their designers to give them the unattractive appearance that so many practical things possess—ofttimes quite unnecessarily.

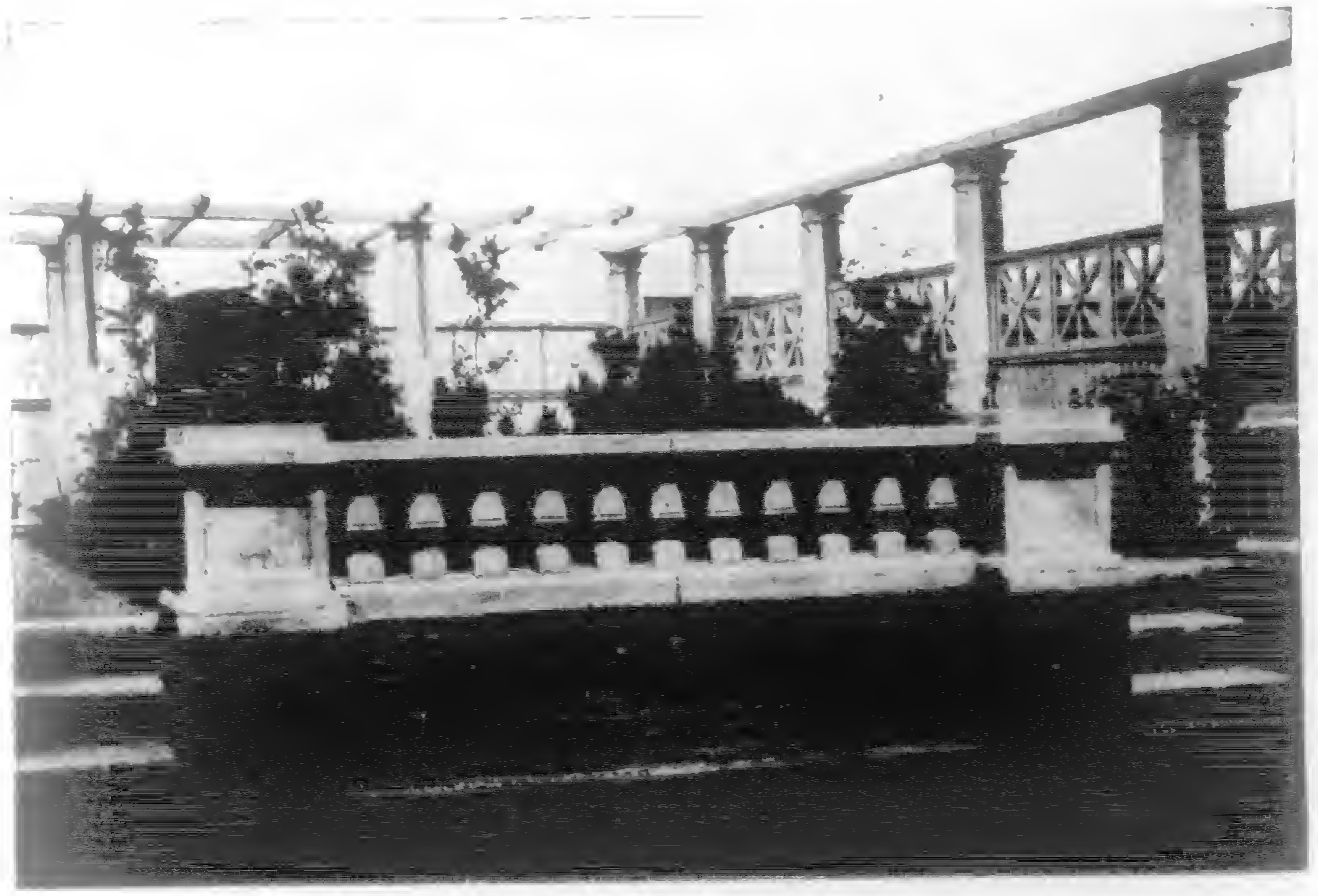
Take the average factory or commercial structure built of concrete, or of any other material, for that matter. That it fulfills admirably the function for which it was designed there is no gainsaying—but how weak it usually is from an esthetic point of view. And again we say—quite unnecessarily. True, the average factory structure is built along the dreary, monotonous lines of a packing box. But, there is no good reason why these same dreary, monotonous lines should not be toned down or mitigated through the exercise of a little ingenuity; for instance, the application at intervals of decorative panels or tablets of concrete, ceramic tile, or faience, having for their subject, perhaps, some symbolic representation of the purpose to which the building is being put, or an artistic monogram, or other devices.

What is true of the concrete factory building is likewise true of many concrete residences, though not to the same extent, as bay windows, paneling, porches, balconies, etc., do much to relieve and break up surfaces here. The use of colored cement and selected aggregates likewise helps to break the monotony of long, bare surfaces. Still, even so, more might be done were more thought given to the subject. Objections on the score of expense do not hold much water, for the cost of ornamentation of the kind suggested is extremely modest.

But, however deplorable, in the esthetic sense, lack of decoration may seem, its complete absence or avoidance is much to be preferred to the mistaken attempts made at adornment by means of tawdry so-called ornaments, largely in the form of cornices and other abominations of tin, iron



Terrace and Sunken Gardens, Wattles Estate, Hollywood, Cal.



Concrete Balustrade in the Yard of a Boston Residence



Garden Seat of Concrete

or other metals that deface so many structures, residential as well as commercial. Not only are these excrescences, so to speak, applied to the interior and exterior surfaces of buildings, but they are likewise called upon to assist (?) in enhancing the beauty of gardens and lawns. Who has not seen gardens, filled with a wealth of flowers, trees and shrubs, carpeted with velvety lawns, pleasing and soothing to the eye, absolutely ruined through the introduction of hideous statues, largely of zoölogical specimens, and flimsy iron fountains and the like? The garden seems to have been unusally unfortunate in having been selected as the target at which so much of what might be properly termed "tinsmith's and iron founder's art" has been aimed. The writer has in mind a certain town in which a person's social and financial standing is delicately hinted at by the size and number of iron lions that dot the garden and glower balefully at the visitor between shrubs and trees.

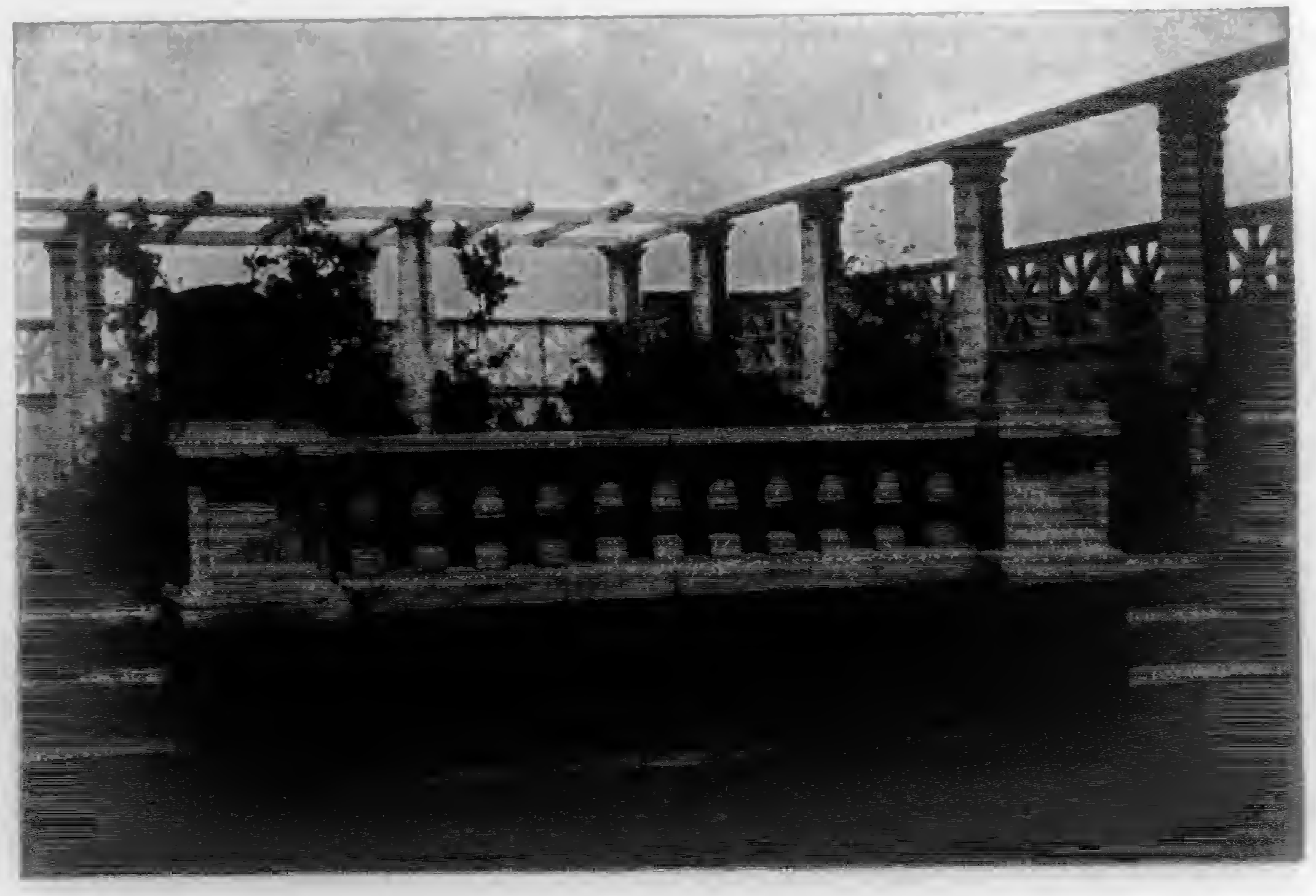
In connection with the ornamentation of gardens, with vases, statuary, etc., of the type shown in the illustrations herewith of work executed by the Garden Studio of Boston, a well-known landscape architect, Loring Underwood, in "The Garden and Its Accessories,"* makes the following statement:

"The appreciation of well-designed garden accessories, which may be had at a reasonable cost, has led architects to try various materials, and of these concrete seems to have proven itself the best. We are beginning to realize that cement has, in addition to its value for structural purposes, possibilities hitherto undreamt of for development along artistic lines. There are many good reasons for using this material in gardens in preference to marble or stone. In the first place, it has the lasting qualities of flint. In fact, it grows harder year by year. Then, too, it does not need any protection against the severest winter weather, freezing and thawing having no effect upon its rigidity. The color of this material in its natural gray cement shade is most pleasing, and seems to blend with out-of-door sur-

*Copyright, 1906, by Little, Brown & Co., Boston.



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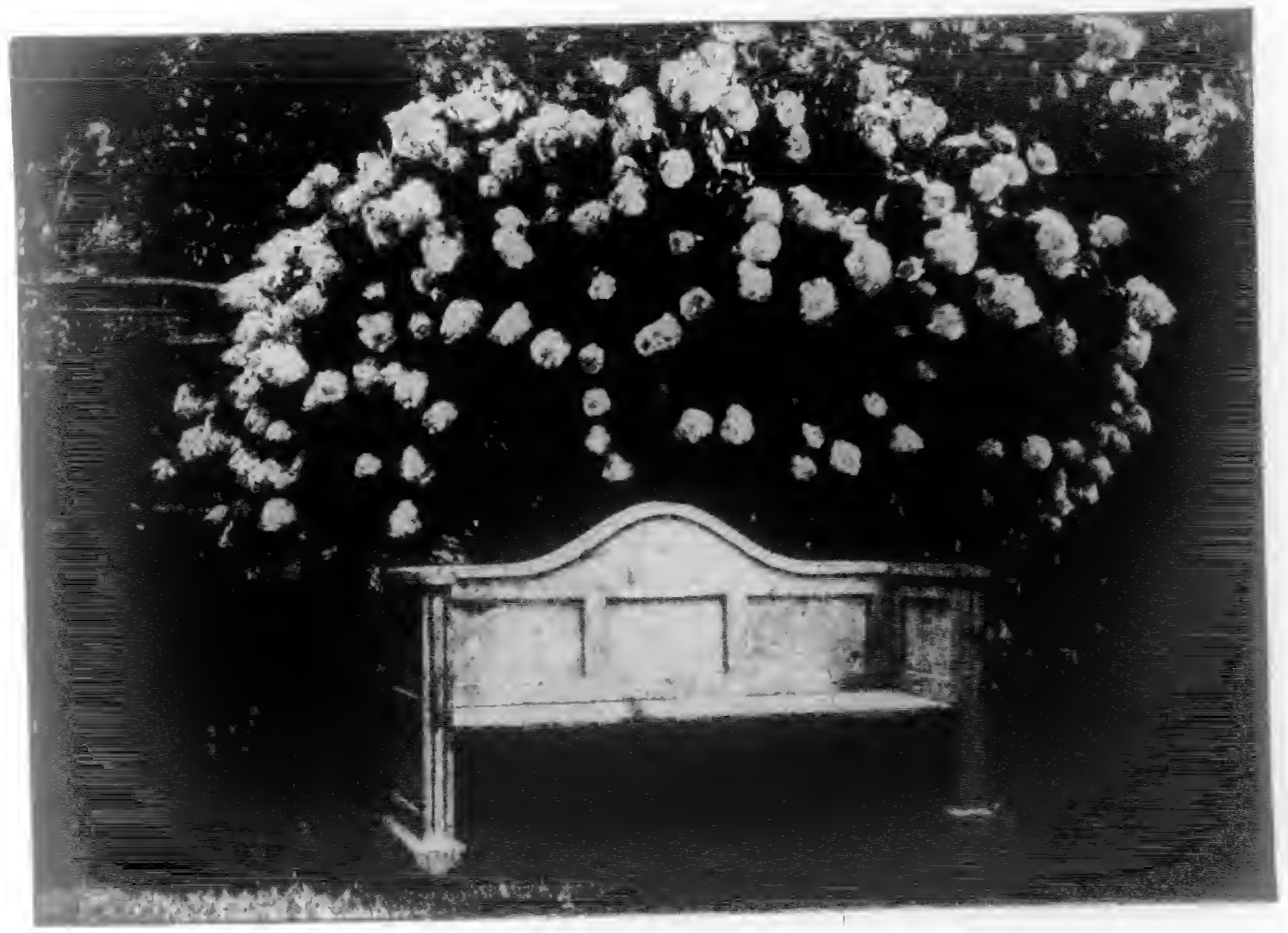
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Garden Vase of Concrete



Garden Bench of Concrete



Renaissance Sun-Dial Pedestal of Concrete

roundings in a way which marble or newly cut stone does not. It takes on rapidly the soft neutral color of the common field stone and, when made into some accessory of pleasing design, never seems to look out of place, as is often the case with imported marbles. Again, the cost of this material is reasonable. Concrete can be fashioned readily into any form, just as plaster and bronze take on the form of the mold into which they are run.

"Some concrete is liable to form hair-cracks, or crazing cracks, on the surface soon after it is exposed to the weather; but these do not imperil the strength of the material. They are fine cracks, hardly the size of a hair, both in depth and breadth. They are not a drawback to a garden-piece, but rather seem to give it a look of age. There is no excuse for attempting to make concrete appear what it is not. The writer feels that he cannot insist too strongly on this point. Some attempts have been made to fashion concrete so as to imitate natural and rock-faced stone, but the results have been, for the most part, only pathetic. A horrible example of the abuse of cement is the block molded in a wretched attempt to imitate rock-faced stone. Frequently these blocks appear of the color and texture of dried mud, the surface having the appearance of having been rubbed with a wet hand, and left utterly devoid of all life and sparkle. To such work as this is due the blame for the impression that cement lacks all possibilities for artistic manipulation.

"The appearance of the unfinished side or interior of these same blocks bears witness to the fact that cement does possess the very qualities which have been covered upon the exposed surface—color and texture."



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Ceramic Tile Panel for Decorating Concrete

Vibrations of Brickwork

THE vibrations undergone by masonry buildings from powerful winds are of a quite different nature from the horizontal stresses to which, as a rule, seismic disturbances submit anything that is acted on by gravity. The latter work at the basements under the form of instantaneous shearing stresses, the former exert successive pulls on the highest part of the building, and the bending moment which the walls have to support is the greatest when the rigidity of the masonry counteracts the more, the tension exerted on the bent surface.

The unexpected resistance which in San Francisco, as well as in Messina, reinforced concrete buildings opposed to the repeated shocks that turned the most solid construction into an utter ruin have put into sufficient light the superiority of that mode of constructon for such countries as are periodically damaged by earthquakes. Unless builders resort exclusively to wooden frames, as the Japanese have had centuries of experience to learn it, no monument can expect to stand long in such countries if it be not interiorly tied up by iron bars or wooden ties of any description. But in the Empire of the Rising Sun old rules have become obsolete and progressive builders there are looking for a proper substitute for the wooden walls and paper partitions. The Government Earthquake Commission had five rectangular columns of uniform size built with bricks and either cement mortar or lime cortar. Under pulls exerted at the highest extremity, which pulls were at once recorded, as were the successive vibrations, by a suitable contrivance, the column 16 feet high and 3 feet 4 inches by 1 foot 9 inches in section went on vibrating as a tuning fork. The diagrams on being analyzed lead to the conclusion that the cement masonry behaves in the same manner, as far as those vibrations are concerned, whether the mortar be made of pure cement or have a composition of one part of cement to one, two, or three parts of sand. Where the column built with the ordinary lime mortar recorded vibrations whose amplitude was three times greater than that of the other columns, no appreciable difference could be detected in the vibrations of that last set. One thing only may account for this fact: the cement mortar, even to the proportion 1:3, is much stronger than the bricks themselves, the result being that only the vibratons due to the bricks were registered, not those due to the joints.—Indian Engineering (Calcutta).



House of Mr. C. Stater, near Belmont, Cal.

Unique Residence at Belmont, California

AT BELMONT, CAL., a unique country house has been erected by C. Stater, a San Francisco business man, who, apparently, believes in catering to all tastes so that his house, if he ever wants to sell it, will appeal to at least three nationalities.

The right wing is of the German order of architecture, and the interior fittings would delight the eyes of the most patriotic member of the Fatherland.

Stater places a buffer between the German style of architecture and French by a Swiss chalet.

One can almost hear the yodel of Swiss mountaineers and see chamois leaping when one gets inside the central portion of this edifice.

The left wing is of the French style of architecture and is a compliment to that nation.

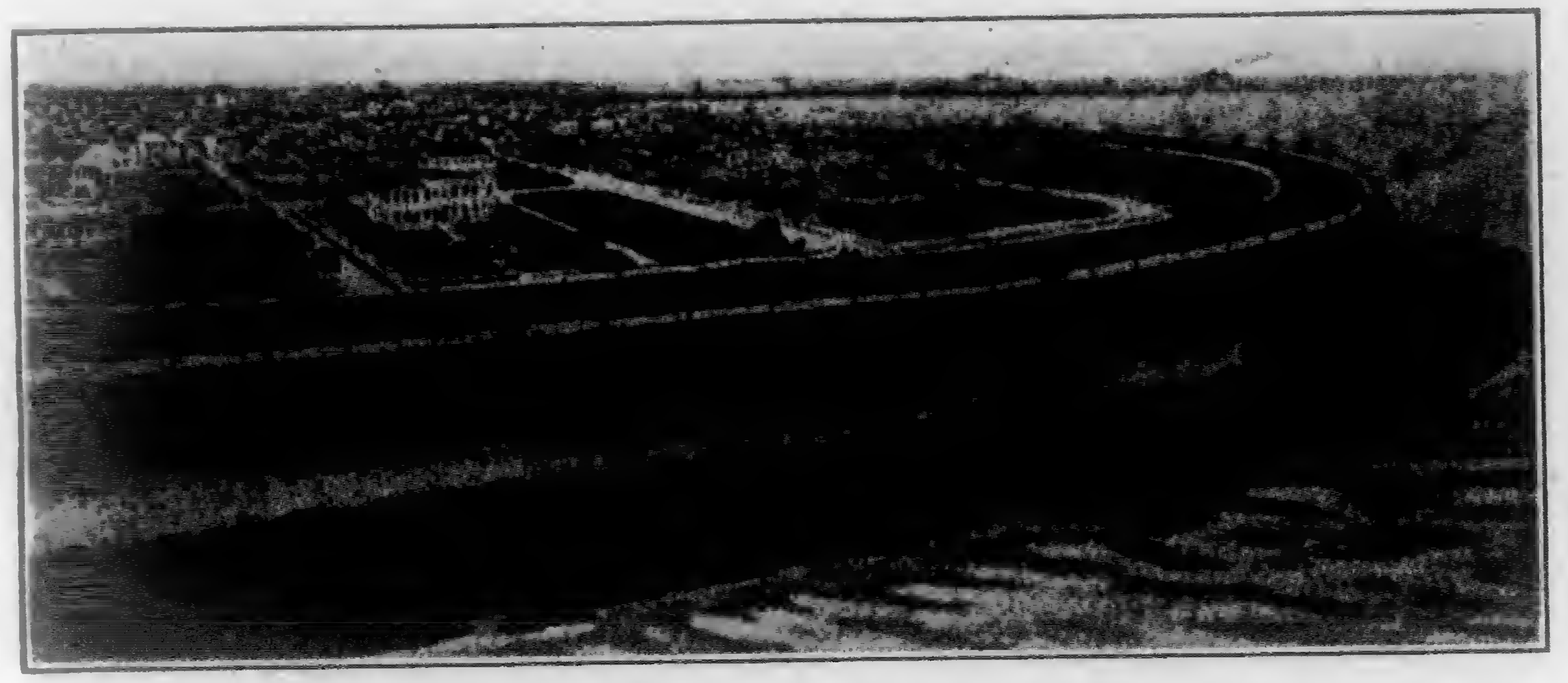
To prove that Stater is a good American citizen he has erected an enormous statue of George Washington in front of the building, which is the admiration of the country round.

* * *

Steam Defends Bank Vaults

Ways and means are constantly being devised to defeat the plans of the bank burglar and the safe blower. The latest inventions are found in the building of the National City Bank of New York, recently occupied, and into which was taken $50,000,000 in currency and securities valued at $500,000,000. Blasts of steam, superheated and kept under such pressure as to flood the entire building in a few minutes, is the main scheme in a deadly system of defense in that building, now said to be the most impregnable financial fortress in the world.

Around the bank's great safe are tons of armored steel, reinforced concrete, iron rails and miles of sensitive alarm wires, in addition to a system of pipes that, should all other means fail to frustrate robbers, would snuff out the lives of scores of burglars should they continue to work near the safe, or it would stand off an army of hundreds of men.



Galveston Sea Wall of Concrete which saved the City

Success of the Galveston Concrete Sea Wall

A HURRICANE of quite as great violence as that which killed thousands of persons and wrecked every building in the city of Galveston in 1900 attacked that city July 21st, without the loss of one single life in the city proper, and without greater loss of property than would have attended the storm had it struck any other city of equal size.

Galveston is now assured of its practical immunity from another disaster like that of nine years ago. A general feeling of confidence has resulted from the splendid action of the seventeen feet high concrete sea wall which surrounds the city on the gulf side of the island and which resisted the terrific onslaught of the sea. The sea wall stood the rough beating of the sea backed by a hurricane producing a seventy-eight-mile wind like Gibraltar, hurling back the immense waves which shot the spray sixty feet in the air.

This sea wall, seventeen feet high and which surrounds the city on the gulf side is built of concrete. On the top of the wall is a wide boulevard, wide enough for driving six carriages abreast. When the engineer designed and built this sea wall grave doubts were expressed by scientific authority as to the practicability of the plan, and as to the strength of the material. It was feared that the work would be wiped out before the terrific onslaught of a sea like that which formerly destroyed the city. Such a storm has transpired and it fully vindicates the design, the dimensions and the material. It is one more great victory for concrete as a material and for concrete engineering in such important structures.

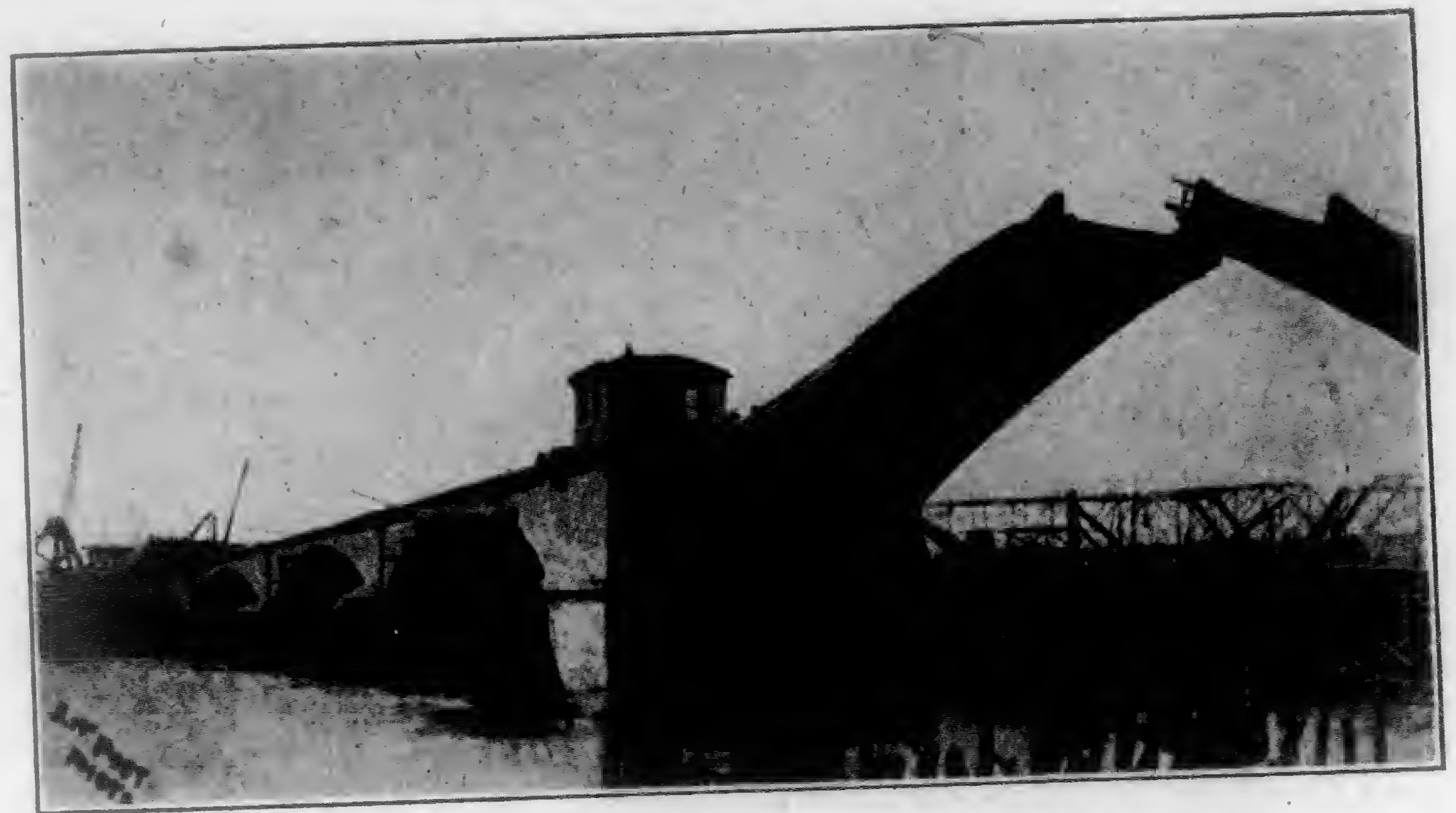
* * *

Blessing Free

"And will you give us your blessing?" asked the eloping bride, returning to the parental roof.

"Freely," replied the old man. "No trouble about the blessing, but board and lodging will be at regular rates."—The United Presbyterian.

It is a wise man who knows his own business; and it is a wiser man who thoroughly attends to it.—Elbert Hubbard.



New Concrete Bridge over the Illinois River, Peoria, before it Collapsed

Failure of a Concrete Bridge at Peoria

EXPERTS who have inquired into the cause of the collapse of a $200,000 reinforced concrete bridge at Peoria, Ill., in May, report that the disaster in no way discredits the value of concrete as a structural material. According to the engineers, the accident was the result of bad foundations—the latter being too insecure to bear the superstructure, and unprotected from the scour of the river after it had been established, the mass above it simply followed the law of gravitation and went down, dragging with it other parts of the bridge.

As to the manner in which the bridge collapsed, the only testimony is that of two witnesses. The following extract is taken from the accounts published:



Showing Bridge after its Collapse, May 1, 1909

It was 5.50 o'clock this morning (May 1, 1909) that James Finley, superintendent of the bridge, and James Costello, the night watchman, stood in the bridge-house at the end of the draw, and heard a wagon approaching. Looking out, they saw that it was a one-horse vehicle in which were seated a huxter named Seiler and his wife, and that he was hauling a small load of wagon truck.

The wagon had not passed more than five minutes when the two men heard a queer noise, as if something had struck the bridge and they thought it might have been a small boat that had collided with the pier, or a heavily loaded wagon coming on the draw. They emerged from the bridge-house, and were surprised to see the first arch east of the draw rise up in the air, break in two and drop into the river.

It had no sooner struck the water when the second span rocked and swayed, and fell, and it was immediately followed by the falling of the third span, and in less than a minute it was all over. The three spans of the bridge had gone down, and the long structure which had been opened for traffic only three weeks, and on which more than $200,000 had been expended, was a melancholy ruin. The three piers stood, the first and second badly rent on the lower sides, while the third pier, which was regarded as defective, stood almost intact.

The cause of the collapse was at once perceptible. The lower side of the first pier from the draw had sunk two feet and swayed toward the draw. This had caused the first span to buckle up, and the steel ribs, unable to stand the strain, broke in the middle and went down.

As the first pier swayed it pulled the ribs out of the second pier, letting the span fall, and in turn the ribs were torn from the third pier and the third span followed the others. All the breaks were clean, and not a vestige of the ribs was left hanging to the piers, and the entire mass that fell away went down in compact heaps, leaving nothing above the water. The destruction was as complete as if the structure had been blown up with dynamite.

William Mullen, superintendent of construction, was early on the scene, and he stated that, while he had entertained some fears as to the condition of the first pier east of the draw, which caused the collapse, he had no idea that it would give way. It had been slowly settling since the bridge had been opened for traffic three weeks ago, but it appeared to have reached a safe foundation at the beginning of the present week, and he believed that the danger had been removed.

Some of the piles may not have reached solid rock, but may have rested upon boulders or a thin shell of slate or shale overlaying a soft stratum. The scouring, said to have been caused by previous floods, was doubtless increased by the high water immediately preceding the failure. The force of the flood would naturally increase the pressure on the downstream piles, and some of these, deprived by the scour of the bracing effect, as well as the fractional resistance of the soil which originally surrounded them, may have buckled or slipped, thus throwing more load on the nearest remaining piles. The failure of these, in their turn, may have thrown more load on to the next, until finally the whole pier toppled over.

You needn't stick too close to the truth with those vacation fish stories, for you will naturally be expected to stretch the blanket a little, so if you merely tell the truth you will hardly get justice in the minds of your hearers.



Vitrified Brick Pavement, Los Angeles

Vitrified Paving Blocks in California

BRICK pavement, practically an unknown quantity in California prior to two years ago, is now beginning to receive recognition and it is predicted that in the future this sanitary and lasting surface material will grow in favor constantly. Vitrified brick has long been held high in esteem as a paving material in the Eastern cities, both for the business and manufacturing districts and the residence sections. The long life of a vitrified block pavement—fifteen to fifty years as contrasted with about one-fourth that length of time for an asphalt surface—should make a brick pavement highly desirable to the property owner. While the first cost of the vitrified black surface is higher, the low cost of maintenance and its enduring qualities outweigh this within a short time.

The amount of brick pavement to be laid this year in Los Angeles will be about double that of last year. Long stretches of certain Los Angeles thoroughfares have already been surfaced with the vitrified blocks since the municipal year began and others are about to be improved in like manner. For gutter work, vitrified brick has already pushed itself to the foreground and much of this class of work is scheduled for the near future.

In other cities of Southern California and the Pacific Coast, vitrified block pavements are gaining foothold. The Los Angeles Pressed Brick Company is shipping large quantities of its product to San Francisco, Sacramento, Santa Cruz, Santa Barbara and San Diego.

When brick pavement was first used in Southern California, it cost about 32 cents per square foot. The price is now 28 cents per square foot, and the expectation is that it will go lower in the near future. As a test of the durability of a brick pavement, it need only be noted that the specifications of the National Paving Brick Manufacturers' Association, which have been adopted locally, require the 20 per cent rattler test. To those



Vitrified Brick Pavement, Los Angeles



Vitrified Brick Roadway, Los Angeles

unfamiliar with this test, it may be stated that this consists in putting brick, to the extent of 8 per cent of the cubic contents, or about ten bricks, together with 300 pounds of iron in square-cut cubes, into a cylinder, such as is used for polishing castings. This cylinder is then subjected to thirty revolutions per minute for an hour. After being taken out, the blocks must not have lost more than 20 per cent of their weight. The severity of the rattler test is apparent. Other tests are also specified, such as the 2 per cent absorption test. These tests, adopted by all municipal engineers throughout the country, are met by the locally manufactured vitrified paving blocks, which attests the high quality of paving material produced.

* * *

Experience is Necessary in Reinforced Concrete Construction

THERE is scarcely a field of building operations in which at first glance it seems simpler for the relatively inexperienced to do satisfactory work than in the use of concrete. Here are simple materials—sand, gravel and cement—mixed by crude labor, usually handled in a crude way, and frequently used only to obtain a relatively crude result in the form of foundations, walls, footings, and the like.

But even here experience counts for much, particularly in view of the fact that work improperly done, is often excessively expensive to remove and replace. With the rapid increase in the use of reinforced concrete the absolute necessity of practical experience and thorough technical supervision is daily becoming more apparent. With few exceptions the failures of concrete are traceable to ignorance on the part of the designers and the contractor—all too frequently to the latter.

Leonard C. Wason, president of the Aberthaw Construction Co., of Boston, Mass., points out with special emphasis some of the principal reasons why reinforced concrete should not be handled by unskilled labor. They are briefly:

1. Because the plans may be incorrectly read. Hence knowledge and experience are absolutely necessary.

2. Because the wrong reinforcement may be used. It is an easy matter to make an error of one-eighth inch in the selection of bars. This may mean a decrease of 25 to 50 per cent in strength. When made-up frames are used error is equally liable in their selection.

3. Because the reinforcement may be wrongly placed. To the unskilled a matter of an inch or two difference in the level of a bar in floor or beam seems but a small matter. But in the case of a four-inch floor the placing of bars two inches instead of three-quarter inch from the bottom may reduce the strength one-half. Bars in columns are easily misset with disastrous results.

4. Because materials for concrete may not be suitable, both in quality and relative size of the aggregates. The difference between concrete made with clean, sharp sand, and that with poor material may be equivalent to a loss of 50 per cent in strength with the latter. Proper judgment—based on experience—is necessary in the use of different kinds of cement.

5. Because the concrete is improperly mixed and used. Errors are always liable to occur in the proportions used. The mixing may not be thorough, the batch may be too dry, it may not be properly tamped, the forms may be removed too soon.

Evidently the handling of reinforced concrete is not such a simple matter after all. It is a work in which the experience of the contractor is the best evidence of the quality of the work.—Concrete Engineering.



Vitrified Brick Pavement, Los Angeles



Vitrified Brick Roadway, Los Angeles

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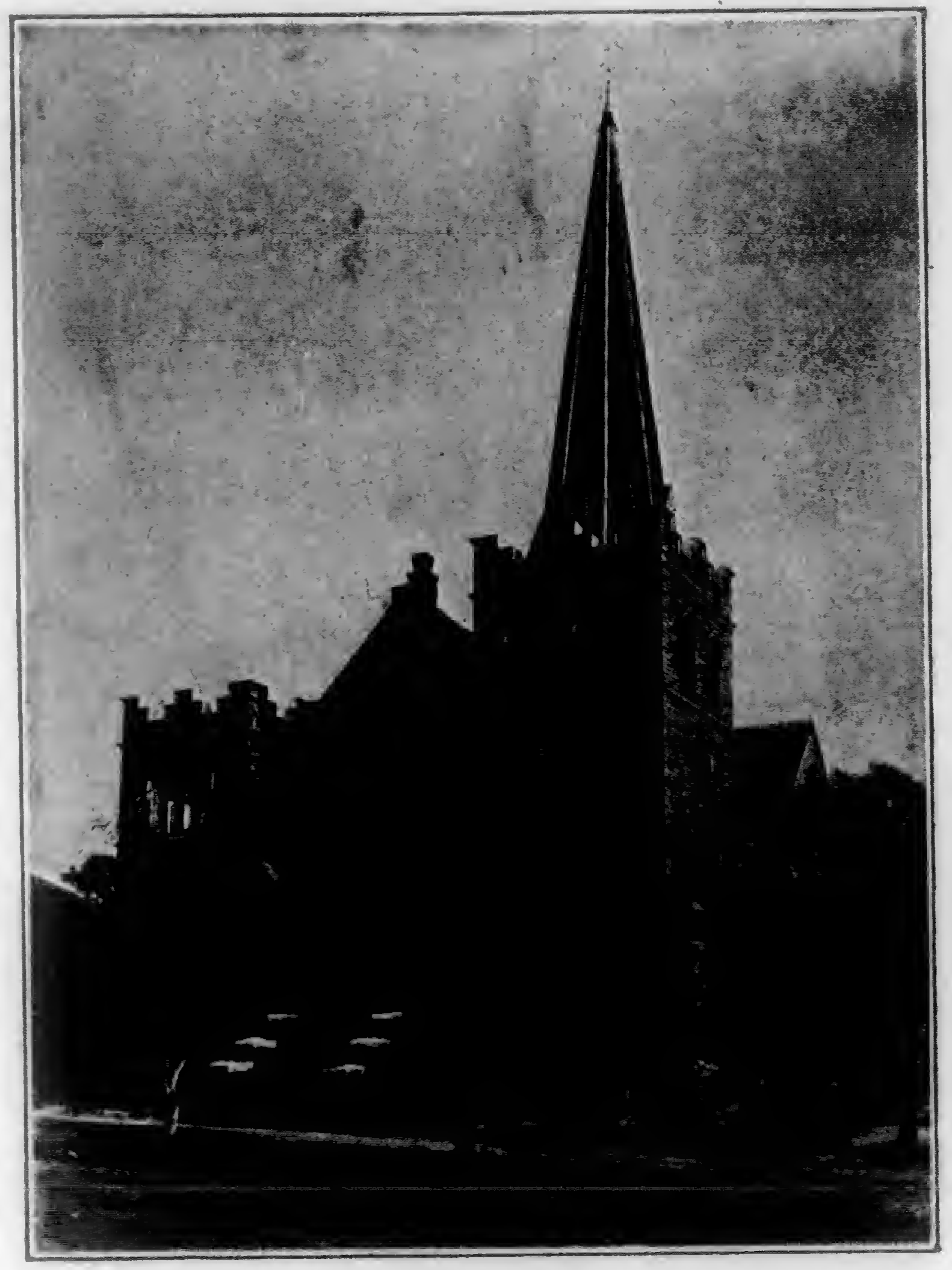
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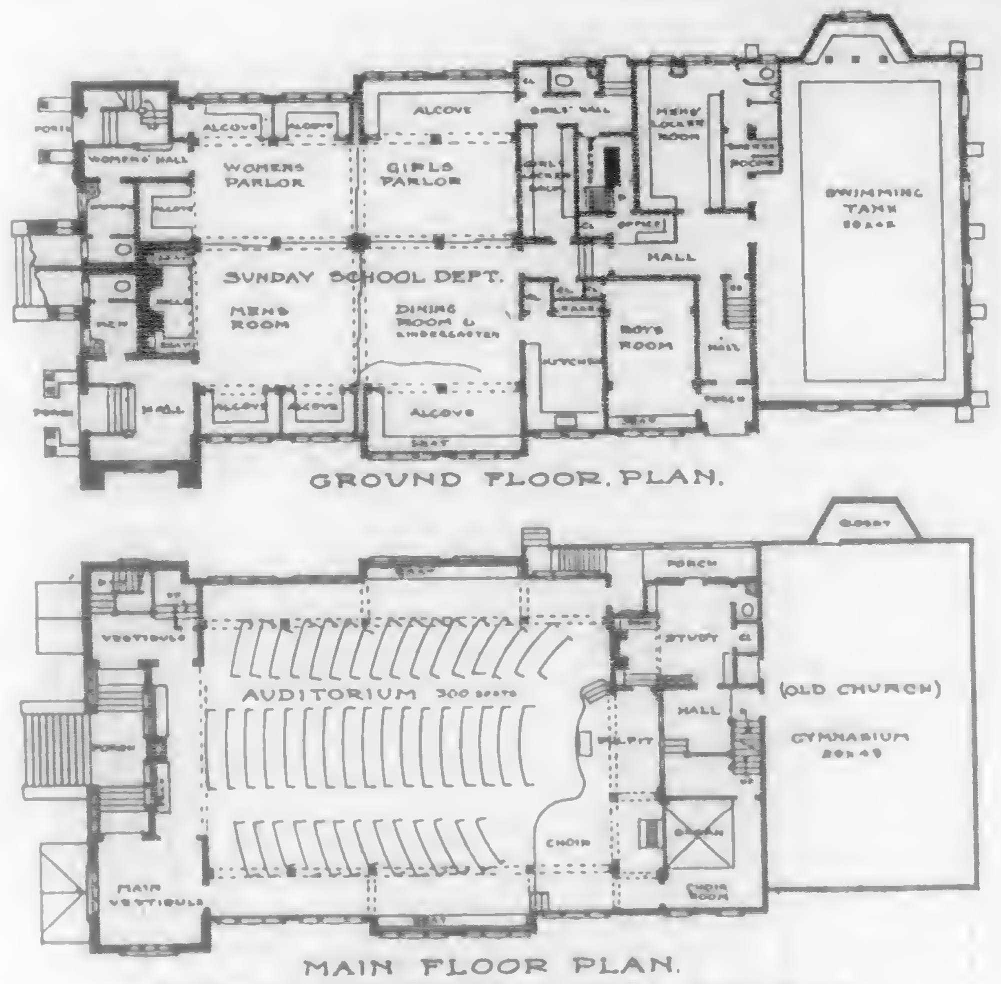
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First Congregational Church, Porterville, Cal.

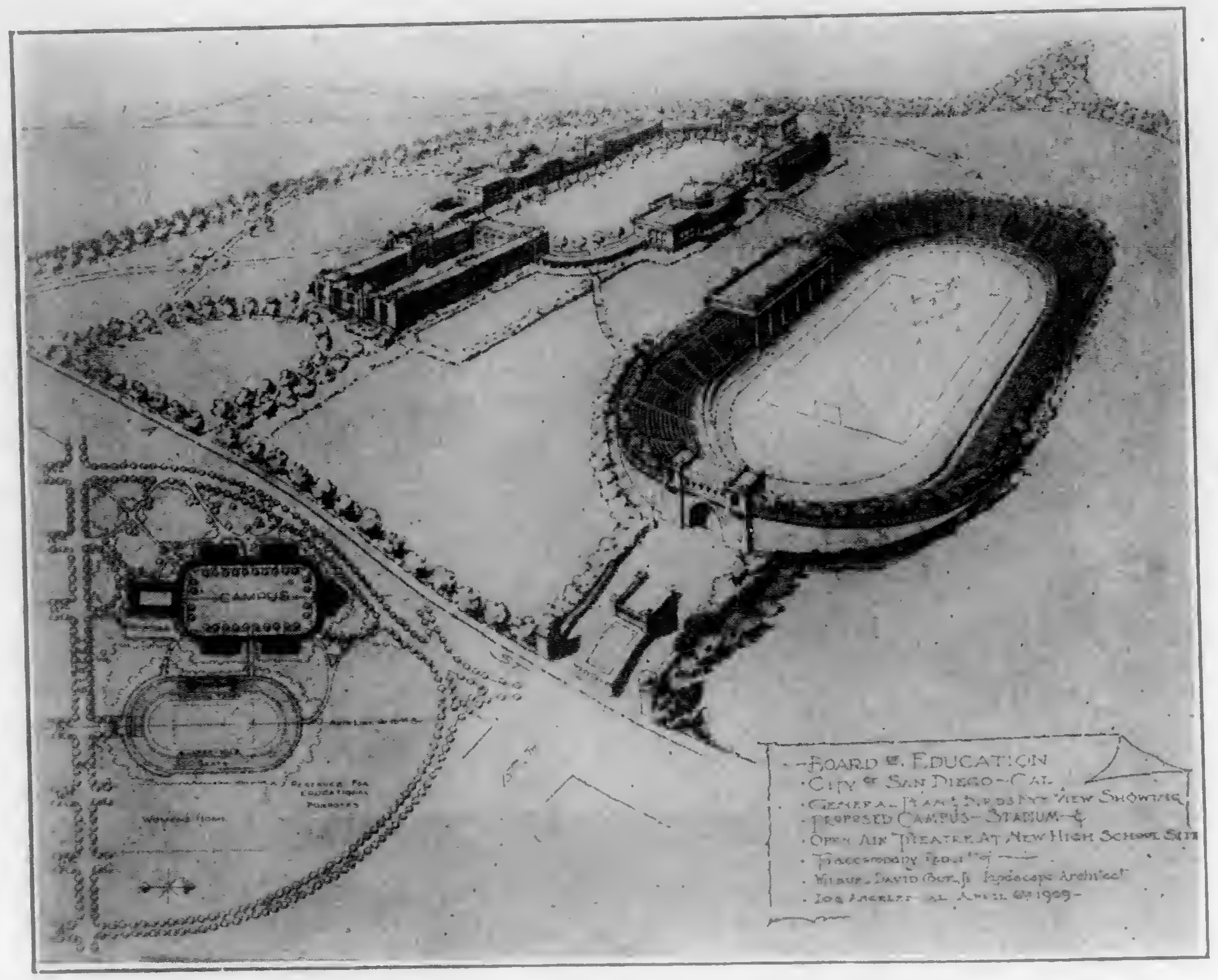
Francis W. Reed and Geo. C. Meeker, Architects





GROUND FLOOR PLAN.

MAIN FLOOR PLAN.
FIRST CONGREGATIONAL CHURCH
PORTERVILLE, CALIF



General Plan and Bird's-Eye View showing proposed Campus Stadium, etc., at San Diego
Wilbur David Cook, Landscape Architect

Civic Scheme for San Diego's Municipal Buildings

SAN DIEGO is the first city on the Pacific Coast to adopt a comprehensive scheme for the grouping of public buildings. Sixty acres of the magnificent City Park have been reserved for the erection of school and other public buildings and a plan for the development and improvement of this tract has been made by Landscape Architect Wilbur David Cook, Jr., of Los Angeles.

A high school building has already been erected and the scheme provides for a group of five additional buildings, which include woodworking shop, foundry, machine shop, drawing school and power house, and an immense stadium with a seating capacity of 20,000.

It will probably be a number of years before the complete scheme can be fully carried out, but work has already begun in accordance with the plans adopted. It is the intention to build immediately only the stadium.

The accompanying sketch gives a splendid idea of the natural advantages for attractive landscape work.

The school reservation lies at the A street entrance to the park between Twelfth and Eighteenth streets. The stadium will be located at the head of Fifteenth street.

All of the school buildings are to be grouped around a campus 250 feet wide by 500 feet long according to Mr. Cook's plan. Low colonades or pergolas running completely around the campus will connect the various structures. The present high school building is 230x130 feet, two stories high, and has an inner court. It was designed by F. S. Allen, architect of Los Angeles. It is built of blue limestone with trimmings and facings

of artificial stone. When it was erected many persons thought a mistake had been made in making it so large, but it is already filled and it will be only a short time until more room is needed. All the new buildings will be designed to harmonize with the structure, which will be the dominant feature of the group.

The proposed campus will occupy the space now given to an athletic field north of the high school building. It is proposed to surface the campus with some material which will give it a buff tone similar to that of the walks already constructed, and to treat the surface with a light distillate oil, which would go a long ways toward abolishing the dust nuisance. Trees are to be planted around the edge of the campus, and curbs six inches high are to be run around all the buildings twenty feet from them. This will give a seating of greensward or shrubbery and will admit the area of maintained ground.

A natural amphitheatre has been selected as the site for the proposed stadium. This site was first recommended by the late George Cook, landscape architect to the city of San Diego. The natural contour of the side slopes suggests a stadium treatment for this amphitheatre as the slopes can be faced with reinforced concrete seats. Owing to natural conditions a stadium can be constructed at about one-half the cost of the stadiums at Syracuse or at Soldier's Field, Boston. The Boston stadium was built up from a flat field, calling for a concrete backing around the entire structure, whereas the San Diego stadium calls for a back construction only at the southerly end where the main entrance with towers and a broad archway will be located.

Plans for the stadium provide for an enclosure 300x800 feet, with a seating capacity of 20,000. The field trends north and south with grandstand on the west side approximately 180 feet long. On the field will be a four-lap cinder running track, with straight-aways for a 100-yard dash. Inside this track is ample room for a baseball diamond and football field. There will also be space for tennis courts at the north end of the field. A pergola treatment for the top of the stadium is proposed, adding lightness and color to the massive structure, and affording a fine promenade around the entire enclosure.

While the entrance is through an archway at the head of Fifteenth street passing up broad flights of steps to a general landing, this may be closed and the crowds can reach the seats by ramped walks leading to the top of the stadium on either side. This will make it comparatively easy to keep spectators off the field when large crowds gather.

There will be room for shower and plunge baths, dressing rooms and for the storage of athletic equipment adjoining the towered entrance.

An open air theatre is planned to occupy the southerly end of the stadium, which may be surfaced with concrete. Sockets will be placed across the field, in which upright columns with clusters of electric lights can be set. Scenery may be suspended from these columns.

* * *

"Be loyal to your employer. It costs you nothing. You pledge your support every time you take a dollar of his money. Help steer the ship that is carrying you. Guard the tent that is sheltering you. Boost the man that is working for you just as much as you are working for him. Think with him. Act with him. Let your heart beat with his. It means team play and success."

The Law Regulating the Practice of Architecture*

V—Building Specifications

By ROBERT MORGENEIER, Architect and Engineer.

FROM title to final clause a building specification should consist of a rationally developed narrative, illustrative of and amplifying the drawings and directing the builder step by step—what materials to use, what labor to employ, and what to do with the materials. Again, every clause of the specifications proper should be in the form of a plain, concise order given by the architect direct to the contractor, in the same style or manner that oral orders are given by one person to another.

In these directions reference will be made to the questions of co-operation of drawings and specifications, figures of reference, commencement, progress, delays, and completions, examinations of work and materials, measurements, tests, authority of architect, etc.; these references attach to the progressive-minute descriptive orders aforesaid.

A careful tabulation of such orders discloses their number, for all and every style of building, to approximate nine thousand, and that these may be grouped under sixty headings.

It is then evident that one can remember only a slight fractional part of this mass of information, and yet any lack of such may result in a serious defect in the written work. Fortunately, however, specification writing is a deliberative operation which permits of search for data at all times and to any extent; also in every well regulated office such data are stored up in abundance.

To enable one to review and examine into the work at any stage, checking lists have been devised. The latest and most complete may be found in "Sweet's." General building specifications can and should be only unilateral—that is, have only to do with what the contractor shall perform—and the introduction of other matter should be studiously avoided. A contrary and pernicious practice, leading to misunderstanding and trouble, consists in making the specifications bilateral in certain parts, by bringing in the owner and stipulating that he shall furnish certain parts, materials or labor. For example, "The owner will furnish the mantels, which shall be set by the contractor." The specification writer should not only have a complete set of the drawings before him, have a complete grasp of the subject matter in its generalized form, detail data in mind and readily at hand, but he should also feel that he is dealing with a contractor, or one person, who shall in the future carry out and perform all of his directions.

The architect should also remember that parol evidence of what was said or done by the owner or himself at the time, or before completing the specifications, is not admissible as between them, and particularly is it not admissible to alter, vary or contradict the express terms of a contract later entered into between the owner and a contractor; hence, what is to be agreed upon shall be plainly set forth in words of known legal value. Let the practitioner firmly impress on his mind that it is a general rule of law that when parties have deliberately put their engagements in writing in such terms as impart a legal obligation, without any uncertainty as to the object or the extent of such engagement, it is conclusively presumed that the whole engagement of the parties, and the extent and manner of their undertaking, was reduced to writing. In short, a specification, to be of value, must be complete, and, in order to be operative without friction, should be unilateral in effect.

*Fifth of a series of articles on "The Law Regulating the Practice of Architecture."

No clause of a specification should depart from the directive style. If the form, "This contractor shall do" so and so, is used, the directive force becomes blurred and may lead to a misunderstanding, or open the door for a contest on technical grounds.

References to laws, rules and regulations shall consist only in an order to obey them.

References to exhibits should, if possible, be avoided; or the exhibits must be labeled with number and page of specifications containing reference to them.

Reference to quality shall be specific; it is not enough to specify that a certain material shall be of "good" quality. "A good quality of lumber" may mean one thing in the mind of the writer, and another thing in the mind of a contractor. "No. 1 select," "No. 1 clear stuff," "No. 1," "merchantable," "No. 2," "culls," and "mills' scoots," all are definite references to lumber, and there are others. Strike "good" from your vocabulary, and find out what you do mean; then write it.

Reference to "standard" quality or "standard" sizes, etc., is another method of hastening your labor and inviting controversy later on. What is standard—viz., of accepted, recognized value—has, under the law, only reference to weight, measure, time and coinage. If these are to be referred to, well and good; if not, the term leads to ambiguity.

"The heaviest and best," referring to piping, means nothing in the eyes of the law. State weight per foot, or thickness of metal — in fact, if the specification holds closely to the two questions of what to use, thoroughly described, and what to do, thoroughly explained, it most fully serves its purpose.

Considering the extent and variety of building specifications, it is not feasible to here formulate a design; but I will state two first items of a simple case, thus:

"General Dimensions.—For general dimensions, examine the plans and the figures thereon. The figures are to determine all dimensions; if not understood, apply for information to the architect."

"Excavation.—Excavate the earth to conform with the foundation plans and to the various levels shown thereon. If any excavation at the level shown is not firm, solid, new soil, advise the architect."

Bilateral and Trilateral Specifications.

In a bilateral specification the owner is generally called upon to perform certain things, such as furnishing materials, fixtures, etc. In a trilateral specification the contractor, owner and architect assume specific obligations the latter generally to determine the design of metallic fittings and trimmings and other things slighted in the descriptions. Almost without exception the tri-lateral evil is in vogue. The easing of the first burden, the postponement of decisions, the flattery extended to the client, by giving him voice in the undertaking are all paid for, pound and pence, by the practitioner in loss of time, useless conferences, misunderstandings, dispute and lowering of prestige and, finally, in a test at law, the entire contract may be voided; at least its complex nature invites to such end.

Index.

In specifications of any length it is usual to append an index. If this is done it should be preceded by the following notice:

"This index is prepared for the assistance and convenience of contractors, and is not a part of the following specifications."

Schedules on Drawings.—These form part of the plans and specifications, and must be complete and perfect. A defective schedule is sufficient ground for an action at law.

Notice of Owner's Intention in Relation to Bids.

It is necessary to acquaint prospective bidders with the owner's intention as to the acceptance or rejection of bids in one of two forms. His intention will be to reserve the right to reject any or all bids, or to let the work to the lowest responsible bidder. One or the other of these intentions should appear on the title page of the specifications.

Drawings Form Part of the Specifications.

Drawings are integral parts of the specifications and shall be numbered consecutively, starting with No. 1 for the first sheet of the foundation plans. All reference to the drawings shall be by number of sheet, followed by particular reference upon such sheet.

Drawings are of two kinds, viz.: general and detailed.

Of the first it is required that they "must be ample, and consist of a foundation plan, plan for each floor, roof plan and elevation of every side of the proposed building."

Of the second it is required "that all parts of any building not clearly and plainly shown to the satisfaction of the contractor, shall be shown in enlarged detail drawings." The California statute further provides that all such details must be on a scale of at least three inches to the foot, and if not so drawn and signed accepted by both the owner and the contractor, the contract between them shall be void. There are no cases on record showing the voiding of a general building contract on these grounds, and it need hardly be said that no contract can be so voided.

A contractor may, however, demand the details as described, and if these are refused him he would have a cause for action under the statute. Otherwise a contract can be only voided if it is shown to have been obtained by fraud, or is against public morals, etc.

The statute is on a par with that provision of the California Penal Code, making the use of money received by a contractor as payment for work done, and not applied by him to the payment of labor and material expended on such work, a penal offense. The intention here is to protect material men, laborers and owner from the possible dishonesty of a contractor, but when it is remembered that money paid a contractor for work done becomes his property absolutely the futility of such statute is at once evident.

It is not the business of a contractor to present supplementary details, yet some architects get down to the level of asking the contractor to furnish such details, and at the same time openly admitting that their specifications and drawings are incomplete and defective.

The following clause illustrates such a "come down."

"This contractor to submit promptly to architect, for his approval or correction (?), diagrams showing all points involving special construction 'which may not be clearly shown on architect's drawings; as, for instance, pointing, bonds, bed, anchoring, engagements with structural iron, construction of cornices, railings and transoms, arrangements for gutters, down spouts, etc.' "

This clause voids everything previously or subsequently ordered regarding the parts referred to, and at the best stands out as a blemish on the specifications.

The directions should read, "join, bond, bed, anchor and engage to structural iron, all brick or stone work, terra cotta or other material

strictly in accordance with the detail. Construct cornices, railings, transoms, gutters and down spouts as shown, and in case of any uncertainty as to the meaning, size, shape or relative position of part or parts, apply to the architect for explanations."

Use of Specific Materials.

Every material of construction shall be specified, and if necessary its particular physical properties shall be set forth, thus in steel construction the carbon percentage, tensile strength, stiffness or modulus of elasticity. Method of perforation and joining must be fully described and ordered. This applies also to reinforcing metals used in concrete or elsewhere. There shall be no substitution of one material for another, nor shall the contractor be allowed to select particular brands or makes. In fact, a prohibitive clause to this effect should be found in every well framed specification.

Remembering that the specifications are directed to an individual, i. e., the "contractor," continue your orders to him. Do not say what the carpenter, the plumber, the bricklayer, plasterer, sewerman, etc., etc., shall do, or what these are to furnish. Your contractor, having agreed to erect the building "as shown and described in your plans and specifications," is under no obligations to follow any orders on how to do the work or who is to furnish certain materials.

There is, however, a material difference if the work is to be done by craftsmen contractors, instead of by a general contractor. Then the orders must be explicit and how, what and when work is to be performed or materials furnished must be specified.

For example, the plumber must be told where his work is to meet that of the sewerman, and which one of them shall connect plumbing to sewer, etc., etc. Also, it behooves the writer of such a specification to be well informed in all the procedure, rules and regulations of the trade unions to avoid conflict with them. For example, do not specify that the plasterer shall plaster the outside of any house with cement and sand mortar. That work is done by the cement workers.

It should, however, be well understood that such union demands have no legal status, and orders in a specification in conflict with them have no effect upon the instrument one way or the other, but being trouble breeders they should be carefully avoided. If a patented article is specified the owner, as well as the contractor, will be liable in case of infringement, as infringement consists in the unauthorized manufacture, sale or use of a patented object. Specifying that a contractor shall be liable holds good as between him and the owner only.

Detailed Drawings Shall Be Signed by the Owner and the Contractor.

To stay within the law and shut the gates on future litigation, all of the details required for the ordinary run of work should be prepared and attached to the contract before any work is performed by the contractor. Knowing the lax and slip-shod methods of supplying details indulged in by some architects, I can imagine their resentment at the above proposition, but, notwithstanding, I earnestly urge the young practitioner to start in by handing the contractor a full set of drawings, with all the details shown, to make no reference under "general conditions" of details "to be furnished from time to time."

In reinforced concrete and steel contruction the building inspection departments of our larger cities demand details of all those parts carrying loads, viz.: girders, columns, beams, spandrels, floors, etc., before issuing

building permits; consequently, the architect in these cases is forced to detail his general arrangement. Then why not do this in all cases? Not that we depend upon the "amen" of any inspector, board of works, etc., but because we should depend upon our own thoroughness and have enough amibition to show it.

If there is any one thing that should be impressed upon the minds of architects, owners, contractors and builders alike, as well as upon the minds of officers and managers, it is the fact that both drawings and written specifications shall be complete. There should be shown and contained every feature, term, instruction and order, as prior and contemporaneous agreements, upon which shall be based the actual, segregated, contract between owner and contractor.

This painstaking micro-cosmus applies not only to the structure itself, but to all of its utilities, equipments, aesthetic features and every factor in any way bearing upon the subject. The load upon the architect is materially lightened by the willingness, yes, the eagerness of parties furnishing equipment to furnish their own details, so that in relation to these, viz.: gas, electricity, heating, ventilation, light, both natural and artificial, water, fire protection, sewerage, plumbing, mail chutes, speaking tubes, elevators, telephones, pneumatic piping, dust collection, regulation of acoustics, exterior and interior sculptural and mural decoration, etc., only accepted and well-known brief descriptive drawings and symbols are required in the general arrangement, and to these shall be attached the details of the above specialties.

The architect's main efforts in relation to equipment and finish should then be to protect the owner against useless expenditure, and make the collaborations fit into and be part of a complete scheme; of data and detail so incorporated the architect should have the profferers contract to furnish on demand and at the figures mentioned when the details were offered. Thus, for example, if the details of a freight elevator for a six-story building are shown, the architect should have the manufacturers offer to supply such equipment for about $2,500, in his possession, to the end that he may check off any bid for such work from the same parties later on.

One of the aims of the California statute regulating the use of the title of architect is to safeguard the owner against useless expenditure, by confining the use of such title to those who can show, upon examination, that they know what properly belongs in a certain class of building and what the approximate cost thereof will be. If an architect assures an owner that a certain proposed building for which preliminary sketches have been prepared will not exceed in cost a certain specified sum, and, upon submitting completed plans substantially like the sketch plans for bids, and the bids received greatly exceed the cost figures first mentioned, the owner is not under obligation to pay the architect for the plans, and if he has paid for them wholly or in part he can recover such payment. At all events, what has been specified shall come within the first cost estimate, and should, following the practice in engineering operations, be less than the initial estimate.

Specifications for a Percentage Basis Contract.

Under this form of contract the general conditions are modified, the drawings and specifications remain the same. Under such conditions the working contract is trilateral in effect. The owner becomes his own builder, the contractor is the uncontrolled foreman on the job, as far as the owner-builder is concerned. The architect is supposed to direct the foreman, by and with the consent of the owner, and audit all accounts.

Of this more will be said under the head of "Contracts" later on. Suffice to say here that any architect deliberately making himself a party to such an arrangement deserves all the trouble surely to follow.

Specifications with Owner as Builder.

Occasionally an owner (generally without experience in such matters) desires to be his own builder, buying his materials, hiring his craftsmen and laborers, and directing the construction without architectural superintendency.

In such case there are no title, general conditions, contracts, bids, etc. The drawings and specifications will, however, be the same, but if possible written with greater care and elaboration. The work to be done by each craft or trade to be particularly noted and segregated where possible.

If, after commencing operations, the owner calls upon the architect for advice, information, directions or examinations, all such services are extra, and chargeable to the owner. Such charges are also lienable.

Specification with Craftsmen as Distinct Contractors, and Under the Direction of the Architect.

This is the oldest and in many respects the most potent form of architectural endeavor. The general conditions are modified so that the owner and architect are the only parties thereto. The architect must carry out his own plans, direct the work or constantly have a representative present. Each craft is asked for distinct bids, and a distinct contract is entered into by and between each accepted bidder and the owner. The operations under this arrangement will also be referred to more in detail under the head of "Contracts."

Duplication of Specifications.

In addition to the office copy there shall be at least three typewritten copies of the specifications, the pages of which shall be numbered; where the undertaking is extensive a greater number will be required. For each set of specifications provide a complete set of blue prints, and carefully check up both drawings and writings, and make any necessary corrections with pen and ink and in each and every set.

The next chapter will treat on bids, contracts and bonds.

* * *

The World Moves

Twenty-five years ago you could not telephone a friend. Ride on the trolley cars. Cool the rooms in hot weather with an electric fan. Turn on the common electric light. Send a wireless message to your relatives on shipboard. Set your watch by an electric clock. Purchase an electric automobile. Walk in safety in the city streets in the glare of arc lamps. Cook by electricity. Ride behind an electric locomotive. Do the family ironing out of doors without fire. Drive all machinery with motors. Live in a house without a chimney. Keep warm by electric heat. Develop out-of-the-way water power and transmit that power to the cities. Ride on an electric elevator. Listen to the telharmonium. Take an electric message or listen to an electric phonograph.—The Office Digest.

A North Dakota improvement company has been advertising its new apartments and arousing interest and knowledge of them by offering a small cash prize for the best name for the new buildings.

Color Harmony in Home Decoration

"COLOR Harmony in Home Decoration," is the title of an interesting discussion by Mary and Lewis Theiss, who interviewed Frank Alva Parsons of the New York Art School on the subject. The result is a very comprehensive treatise on the subject of color and harmony as they should be applied to home decoration. The most important points emphasized by Mr. Parsons are given here.

Lack of color harmony in home decoration is as insidiously harmful as lack of fresh air. A demand for better art in the home has become universal in America.

Eliminating the element of discord in decorations has brought about a new harmony in the home. Rooms are fitted out harmoniously by salesmen of the largest furnishing houses where four years ago not a salesman in America had any scientific knowledge of what he was trying to do.

Color harmony is based on color relationship. Color is formed first by the primary colors, red, blue and yellow, then by combinatins of these colors. Colors are either blood relations or complimentary. The colors next each other are blood relations as yellow and green. They are parts of one another. The complimentary colors lie opposite each other in a circle as yellow and violet. So we have two ways to form a color scheme by associating related colors or by combining complimentary colors. There should never be a mixture of the two classes. Harmony in color is gained by putting colors together that are related. Colors that lie next each other in the spectrum are related and so are in harmony. But this harmony can be increased by making the colors still more alike. Yellow and green in equal parts form a new color that is more harmonious than the original colors together. Complimentary colors may be combined with a harmonious result. Red and green mixed in certain proportions make gray, an absolute neutral half way between the colors. Between red and gray we can obtain any tone of red by uniting red and green, the red approaching gray as we increase the amount of green in the mixture. The same thing is true of green and gray, the green approaching gray as we increase the amount of red in the mixture. A red that is one-quarter green and a green that is one-quarter red harmonize better than pure green and a pure red. Better still is the harmony between a red that is half green and green that is half red. When we get red that is three-quarters green and green that is three-quarters red we get harmony of the closest kind, both shades being close to the neutral gray.

An equal mixture of the component colors of each pair of compliments produces a neutral gray half way between them. The spectrum comes to resemble a wheel with gray in the center and the original six colors for the rim, the lines of color radiating from gray being like the spokes. Three values are recognized in color, hue, value and intensity. Hues of color change according to the proportion of their component parts.

The value of color changes as it grows lighter or darker. The nearer white the lighter it is, the nearer black the darker it is. The sky is lighter by sunlight than by moonlight, yet may be the same color. The difference lies in the amount of light.

Yellow is the most penetrating color, violet the least. A turkey red is the brightest and most brilliant red that can be produced. In choosing papers, textiles, furniture, carpets, each of these qualities must be taken

into consideration, and hue, value, intensity, resemblance to light or darkness. If any one color stands out more than another in a room the harmony is spoiled. The question of light must be considered; whether natural or artificial light will be used in the room. Colors appear different under two lights. They are different. A blue wall paper looks green at night. The yellow rays of the lamp or gas are absorbed by the paper and the combination yellow and blue makes green. Red by day becomes orange at night. In buying, articles should be examined under daylight and artificial light. The colors of nature should be remembered and in a room the lightest parts should be overhead, the darkest underfoot and the side walls between the two, soft colors are best. Gray harmonizes with all types of complexion.

The decoration of our home expresses something. A room must not only be a mere color harmony, it must be in accordance with the purpose of the room. In a library the colors should be neutral—nothing to disturb the occupant. A ballroom should be just the opposite. The drawing room comes between the two. In a bedroom cool, soothing colors with few ornaments should be the rule. No elaborate pattern in wall paper or hangings to catch the eye of the convalescent.

Loud colors excite one, soft colors are restful. The colors chosen for rooms of southern exposure should be quiet, a dark hall needs a bright paper. Yellow and light red rose are best for this. North rooms need bright colors, yellow, neutral oranges and red. Between northern and southern rooms neutral colors of each of these extremes should be used. "A miscolored house may be positively injurious."

* * *

Import Japanese White Oak for Railroad Cross-Ties

THE growing scarcity of American timber suitable for railroad ties has induced one of the largest Japanese importing companies to introduce Japanese white oak as a desirable foreign species to take the place of the American oak, for railroad purposes. Several of the western roads have already purchased a large quantity of the Japanese white oak to be used in replacing worn-out ties along their rights of way.

The increasing cost of all railroad ties has naturally led the railroad companies to desire to prolong the life of the species of wood used, by preservative methods, and only recently an application was made to the United States Forest Service to conduct experiments at their Berkeley timber testing station to determine the value and life of the Japanese oak timber when properly treated.

This application brought up the interesting point as to whether or not the Forest Service would be allowed to undertake experiments with foreign species of timber, inasmuch as the act under which these experiments are carried on specifically requires that only American grown timbers shall be treated. The Forest Service has found it necessary, owing to pressure of other work, to decline to undertake this experiment, and therefore this point was not considered. It is estimated that there is a large supply of this white oak in Japan and should its use for railroad purposes prove satisfactory, it is probable that a large market will be created for it in this country.

* * *

A Boy's Essay on Woman

"Woman is what men likes to marry. Man is logical; woman is zoological. Both man and woman sprang from monkeys, but men sprang the farthest."

The Local Architecture of San Francisco

By B. J. S. CAHILL, Architect.



OF THE many points of view from which one might discuss the work of a local architect of eminence, perhaps those that most commend themselves in this year of grace 1909 can be summarized in the following questions: First, Have we a local architecture worthy of our city and fit to grapple with the problem of a new City Hall, or must we call in outside talent from the East or from Europe? Second, Is the improvement and adornment of San Francisco more likely to be realized by home practice, or by outside advice?

I.

Some time ago the writer made a plea in the public press for local architects and an indigenous architecture. This was taken to mean that "Mission" architecture was the type advocated. There was really no such intention. Local architecture is not necessarily isolated nor parochial nowadays, whatever it may have been in earlier periods of the world's history. This is a difficult matter to discuss clearly, because architecture, like music, being a language of its own, does not lend itself so readily to verbal analysis. Moreover, the English language is weak in this particular. A Greek could describe a building so clearly in words that for purposes of competition a drawing was unnecessary. Probably a Roman or a Norman could do the same. We have neither the language nor the interest in the subject that these people had. Nevertheless, there is an unmistakable growth of interest, not only in the design of individual buildings, but in the general character of our cities—their facades, grouping, skyline and public buildings. Hence it is, for example, that San Francisco has pitched upon a certain general style that is local in a very broad sense. It is a local architecture, on stately and cosmopolitan lines, because our people are of a cosmopolitan culture. Our city has never been provincial in the sense that Chicago is provincial and always will be. The men who have made San Francisco what it is architecturally are local in the sense that they dwell somewhere about the Bay of San Francisco; but their architectural inspiration, like their nativity, is cosmopolitan. Hence the absence of intense individualism, of freakishness, of architectural aberrations, that characterized San Francisco before the fire, and still characterizes it, though to a lesser extent.

The term "local" in architecture, as here used, means the architecture produced on the spot; and, as this is distinctly metropolitan in character, the argument in favor of acknowledging the worth of our own product and encouraging it is already complete. Why import architectural ideas from other cities which are likely to be far more parochial than our own? There is a large example on Market street—a building in buff, pistache and mulberry tiles. While clever and original in detail and bold in construction, it nevertheless has the word "provincial" written all over it. It entirely lacks the genius loci.

The new Palace Hotel is another example. No doubt of admirable plan throughout and the very latest syllable in complexity and completeness of equipment, it is none the less rather a disappointment, looked at as



The New Chronicle Building, San Francisco
D. H. Burnham & Co., Architects

a very important portion of Market street. It impresses the average man as a flat and rather tame looking building. Its extreme brickiness and constricted fenestration may be in the interest of its guests, especially those who may have recollections of a certain day in April three years gone. For all that, it is hard to see why a building devoted to sumptuous entertainment within should so poorly entertain the eye without. However, time will deal better with this than with the Pacific building. If the latter is too gay and reckless, this seems too severe and Puritanical.

A third specimen of imported architecture is the Merchants' Exchange building. Considering the semi-public character of this edifice, its cost, and central location, it is no exaggeration to say that it is the ugliest building in San Francisco. It is ugly in mass, in skyline, in color and in texture. And most of all is it ugly in its attempt at beautification at the corners by a sort of excrudesence of the architecture of the front, that is positively paltry.

This brief glance at three of the most important of our imported buildings may be followed up by noting a few others of local product in the same neighborhood.

Opposite the Merchants' Exchange is the Hayward or Kohl building, by a local architect, one of the most beautiful buildings in San Francisco. Both buildings may have been from the pencil of the same draughtsman; but the one is steeped in the brutal and sordid spirit of Chicago, the other is an example of the liberal and opulent spirit of San Francisco. The one building is a direct product of the "dry goods box" school of architecture which was originated in the City of Wind. Its chief idea is to crowd the most offices in the highest building at the least expense and the most profit.

The Hayward building was the expression of a man who believed in something that was not altogether material. There was a touch of romance about its inception—perhaps folly, if you like; at any rate, it was something human. It was built by a mining man and is altogether typically Californian. Florid and bold in detail, magnificent in material, and without stint inside or out, it is yet entirely metropolitan and without a trace of shoddiness.

Apologists for the ugly structure across the street might have claimed certain fireproof and practical advantages for the Merchants' Exchange building which the Hayward building lacked. If they ever did, they made a woeful error. In the great fire the Merchants' Exchange building was gutted from cellar to skylight and put out of business for a year, whereas the Hayward building was practically untouched, the only tall office building to escape. Needless to say, it earned fat rentals during those many months that the burnt-out Merchants' Exchange building was being restored to use.

Near the Palace Hotel is a building by local architects, the Claus Spreckels building. Soon after it was finished I took pains to search New York for its superior. There was nothing there nearly so good. I think it safe to say that San Francisco had for some years the handsomest tall office building in the world. Since then the stone has somewhat faded out in color and, of course, other tower buildings have, especially in New York, put our Call building in the shade. But does the reader imagine that this distinction was ever conceded to San Francisco? Not a bit of it. The average man, on being asked his opinion, would answer, with foolish evasion: "What a pity they hadn't more frontage on Market street." Or perhaps, with that parsimony of praise that is meant to denote a wide outlook, but is really the sign of a narrow soul, the answer will be: "Too much gingerbread." The same man, on seeing the same building in New York, would probably find it magnificent. I have told many people that the Call building is the finest tall office building in the world. They believe it and tell their neighbors. Seeing that we make so many superlative claims for our climate and the products of our soil, for our literary activity and musical output, it seems unnatural to be so modest about our architecture.

The Call building, however, was sensational and unique when built. Buildings of less obvious distinction but of equal merit are even less likely

to win conspicuous praise. The Pacific building, on account of its novelty, probably receives more attention than either the Emporium or the Flood building. I do not remember ever to have heard any one admit that he was impressed by either of these buildings. Now, both these buildings are of extraordinary merit. They are conceived on a scale that is truly heroic, and they impart to Market street where they front one another a touch of grandeur truly imperial. Perhaps the best effect is produced on one leaving the colonnaded vestibule of the Flood building, with a view of the Emporium framed in the arched exit. Here one gets an architectural ensemble of metropolitan magnificence hardly equaled for dignity and repose in any commercial street scene in the world.

A thousand people pass out of this doorway every day. Yet, of all of them, how many are impressed by what they see? Most of them don't see and don't care; yet our newspapers, which represent these thousands, never tell of the good architecture already in San Francisco, but are eager to advocate universal competition whenever an unusually large or important building is to be designed. In this particular our lack of belief in ourselves and our faith in outsiders is remarkable.

II.

Fine architecture is a twofold product: we must have the men to build and the men to design the buildings. The desire for fine buildings must first be manifest. This is largely a matter of the personal temperament of the land-owning class. Added to this must be a professional body of architects much more desirous of producing fine architecture. In this connection let us compare Chicago with Buenos Ayres. Both cities have grown rich on the meat and wheat of a fat hinterland. They are prosperous, rich and progressive in about the same degree. Yet, in the main, the architecture of one is as beautiful as the architcture of the other is brutal.

Racially, historically, and by sentiment and affiliation, San Francisco is in matters of architecture much nearer to Buenos Ayres than to Chicago. We have in common a greater desire for beauty in our buildings and a willingness to spend more money to that end. We desire, moreover, to have a beautiful city. In this Buenos Ayres is still very much ahead of us—not so much by any cunning layout of streets, for the plotting of Buenos Ayres is rectangular, with wide, straight streets, like San Francisco, and not narrow, crooked ones, like Paris. The people of Buenos Ayres have no need of cutting new streets or laying out "peripheries of distribution." But, having a real desire for civic beauty, they have seen best to create it by making their facades as attractive and harmonious as possible. They have a regulated skyline, a tendency toward a uniformity of treatment in material and detail, an abundance of trees, an absence of unsightly signs, and a certain urbanity of finish making itself felt in their treatment of trolley poles and their suppression of those disfiguring features of overhead service wires.

And nine-tenths of all city beautification lies in these things and not in cutting extravagant thorofares in arbitrary imitation of other cities whose layout is entirely alien to our own. Moreover, it is extremely questionable whether it is within the power of the most gifted intellect to anticipate the development of a commercial city as far ahead as a single generation. A purely administrative and bureaucratic city like Washington, D. C., or Dalgety in Australia may be laid out in advance because there are few elements strong enough to mar the plan. Or an official city founded by an autocracy and ready made by government and run by imperial decree, like Dalny, may come into being and retain its prescribed form. But even these are

rare. The history of Washington itself is a proof of this. Its original layout was quite ignored after a few generations, and it was only after great effort, much agitation and vast expense that the original plan was restored, improved upon and ratified by Congressional action. After the great fire of London, Wren made a plan for a new city. It was the prototype of L'Enfant's plan for Washington. In spite of Wren's ability and the undoubted excellence of his plan it was not carried out for the very obvious reason that London could not afford it. It is as futile to regret the "lost" opportunity as to regret the fire that seemed to create it. Wholesale street improvements made by condemnation follow the line of the greatest and not the least resistance. Wren's genius, however, was abundantly employed in individual effort. And it is on these lines that the City Beautiful comes into being. Any great commercial city that is also a seat of government and a social center will of itself develop a few great buildings. These will, in time, attract other structures. The next step is to develop open spaces and approaches and finally will come new thorofares to relieve congestion. These come after and not before they are needed. This procedure may not appear reasonable and not please the fancy of some poetic souls, just as economic facts are distasteful to immature students and doctrinaires, but they are the *facts* of city growth and they obey mightier impulses than any so-called expert can control. Any attempt at a comprehensive plan is presumptuous as well as impossible. The most that can be done in a city as young and immature as San Francisco is to aim at general excellence of design in all buildings and particular effort and zeal in achieving monumental dignity and beauty in our public buildings, especially our City Hall. This much assured, it will be time to consider a suitable setting for such a building or buildings. An educated public opinion, guided by expert advice, should control or advise in the purchase of sites for public buildings. No more pernicious influence to mar a city's growth in beauty can exist than the sordid and grasping real estate operator who uses his influence to suit himself at the expense of the city's funds as well as the city's future.

Along the lines indicated in the above paragraph San Francisco is developing with a boldness, a splendor and a thoroughness, all things considered, nowhere surpassed in the United States. And this is due, as we have seen, to our local architects and their work. The importations have been the weakest and the worst. I shall conclude by specific allusion to two more buildings in close proximity, one by a San Francisco man and the other by a Chicago firm. It is a perfect illustration of my thesis. If you walk out Market street to Lotta's Fountain you will see a tall, conspicuous building on the right hand side, of most agreeable proportions and irregular fascinating skyline. It has a high pitched red tile roof and piles up with gable and dormer into a group of forms delightful to look upon. It is the Mutual Bank building. In its way it is a fitting complement of the Call building,to which it forms a striking contrast. But the facade that greets the eye, on examination, turns out to be the flank property line running from Market to Geary street, and not a street front at all. Another lower building really terminates the gore. Now, as a matter of fact, the owner of this gore exercised his right to prohibit and, I believe, did prohibit the Mutual Bank building from overhanging his property with any cornice, or moldings, or architectural finish. In spite of this the directors of the bank and the architect deliberately co-operated to treat with architectural embellishment this important wall. What might have been an extremely unsightly block, viewed from the northeast, has thus, at considerable expense and trouble, been rendered most picturesque and attractive. If the owners of the corner chose to build high this dead wall, so handsomely treated, would, of course, be useless and the

money thrown away. This risk must be credited to owner and architect as well.

Now, let us walk past this building and turn back toward the ferry. The deadwall on the other side of this building is handled with the same deliberate aim to mask as much as is reasonable the ugliness of a precipice of brick, and to give a sense of architectural composition to the skyline. The result is admirable.

Let us look, however, a block beyond, at the Chronicle building. It is not necessary to say much about the original building. It has the merit of being the first tall steel-frame building (class B, as we now say), and it was built in the style which was once the vogue, more especially in the provincial towns, but which is now out of date. But the annex on Kearny street, which shoots up half a dozen floors above the added stories of the old building, is a subject for comment. The conditions here were very different from those which beset the Mutual Bank building.

Of equal importance with the other three corners of this, the real hub and center of the city of San Francisco, it had the advantage of being under one ownership. Added to this was the fact that the new building on Kearny street was not carried up above a building whose roofline was permanent. One architect had both buildings, and the top of the older and lower one was to be entirely remodeled. Here was an opportunity to blend one building with another in a harmonious composition of wall and skyline, seldom offered to an architect. It is difficult to think of any local man intrusted with this work who would dare to ignore this obvious duty.

Finally, in answer to the second question propounded in the beginning of this article: The actual improvement and adornment of San Francisco is being carried bravely forward by such men as Mr. Pissis and our own architects in a real and effective manner.

* * *

Government Now Requires Specifications for Fuel Supply

THE plan inaugurated two years ago by the Government for the purchase of coal on its heating value has resulted in the delivery of a better grade of fuel without a corresponding increase in cost and with therefore, a saving to the Government. At the present time forty departmental buildings in Washington, the Panama Railroad, more than 300 public buildings throughout the United States, navy yards and arsenals are buying their fuel supplies on specifications, the prime element in which fixes the amount of ash and moisture.

Premiums are paid for any decrease of ash below 2 per cent from the standard at a rate of $.01 per ton for each per cent. Deductions are made at an increasing rate for each per cent of ash when it exceeds the standard established by 2 per cent.

It has been demonstrated by the United States Geological Survey, Technologic Branch, which has charge of the analyses of the coal, that under these specifications the Government has been getting more nearly what it pays for, and paying for what it gets.

The purchase of coal on specifications is but one of the activities of the Government looking toward a more efficient use of the fuel resources of the country. Engineers of the Geological Survey are studying the problem in all its phases at the experiment plant in Pittsburg, Pa. The investigations, by suggesting changes in furnace equipment and in methods of firing the coal, are indicating the practicability of the Government purchasing cheaper fuels, such as bituminous coal and the smaller sizes of pea, buckwheat, etc., instead of the more expensive sizes of nathracite, with a corresponding saving in price. The fuel bill of the Government now aggregates about $10,000,000 yearly, the saving on which, through securing coal containing less ash, alone amounts to $200,000.

Since the Government has been purchasing coal on the basis of its heating value a growing interest has been manifest on the part of manufacturers and the general public in this important subject, and a demand has been created for authentic information concerning the results accomplished. In response to this demand the results of the Government's purchases of coal under the heat value specifications for the fiscal year 1907-8 have been assembled in a bulletin just issued by the Survey in the hope of promoting a better understanding of this method of buying fuel. John Shober Burrows, the engineer in charge of this part of the fuel problem, has included in the bulletin a list of the contracts, with abstracts of the specifications for the current fiscal year.

In explaining the nature of the specifications, Mr. Burrows says:

"Government specifications are drawn with a view to the consideration of price and quality. For manufactured articles and materials of constant and uniform quality they generally can be reduced to a clear statement of what is desired. For coal, however, the variation in character makes this impracticable.

"This lack of uniformity is the feature recognized and provided for in the coal specifications prepared by the Geological Survey. Under these specifications bidders are requested to quote prices on the various sizes of anthracite, a definite standard of quality being specified for each size, and to furnish the standard of quality with price for bituminous coal offered. Awards are then made to the lowest responsible bidder for anthracite, and to the bidder offering the best bituminous coal for the lowest price. The specifications become part of the contract, and the standards of quality form the basis of payment for coal delivered during the life of the contract. For coal delivered which is of better quality than the standard the contractor is paid a bonus proportional to the increased value of the coal. For deliveries of coal of poorer quality than the standard deductions are made from the contract price proportional to the decreased value of the coal. The actual quality and value of coal delivered is determined by analysis and test of representative samples taken in a specified manner by agents of the Government and analyzed in the Government fuel-testing laboratory at Washington. The necessity of paying for coal on a sliding scale was fully discussed by D. T. Randall in a recent paper."

The advantages of buying coal on specifications are explained by Mr. Burrows as follows:

"Bidders are placed on a strictly competitive basis as regards quality as well as price. This simplifies the selection of the most desirable bid and minimizes controversy and criticism in making awards.

"The field for both the Government and dealers is broadened, as trade names are ignored and comparatively unknown coals offered by responsible bidders may be accepted without detriment to the Government.

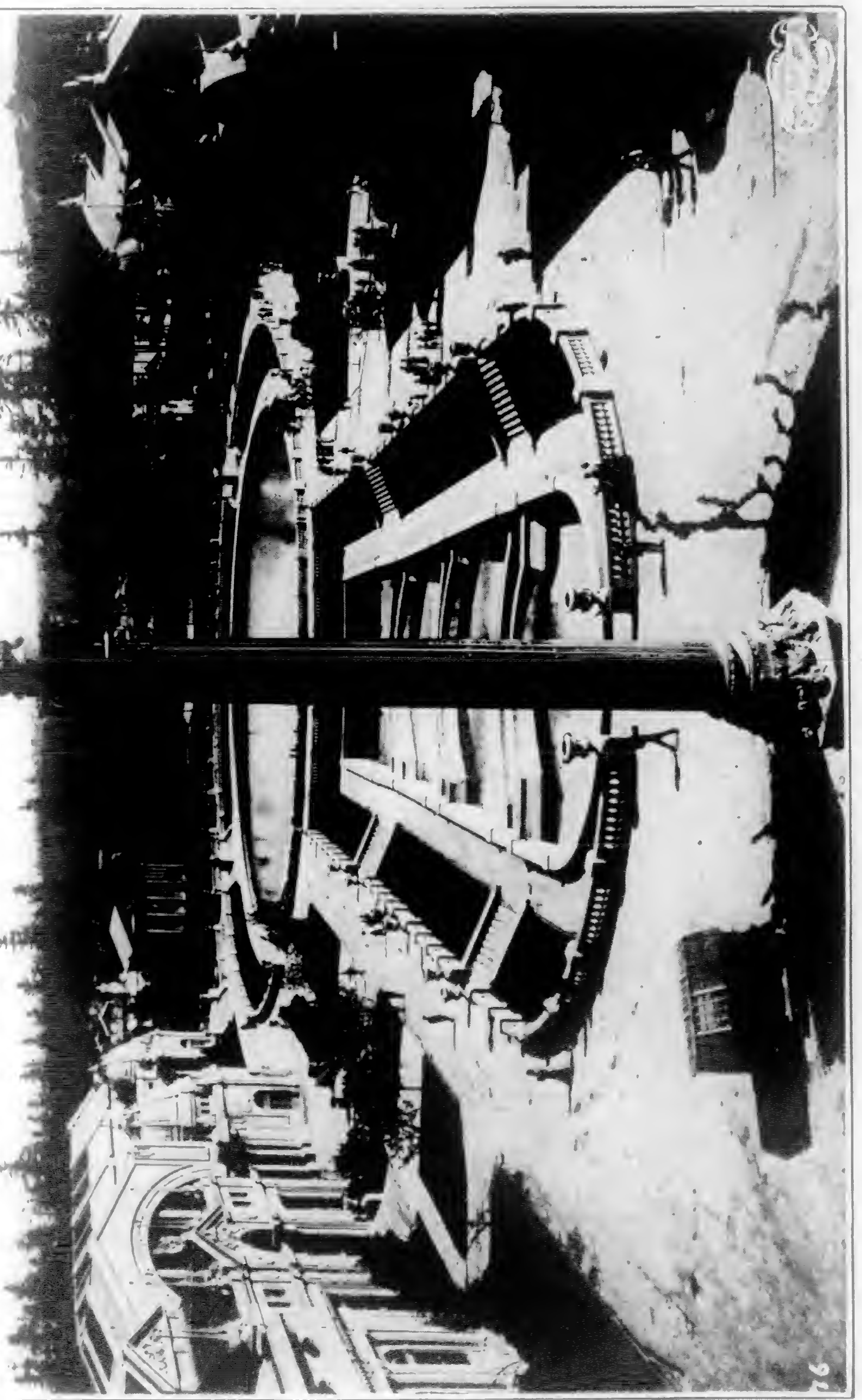
"The Government is insured against the delivery of poor and dirty coal, and is saved from disputes arising from condemnation based on the usual visual inspection.

"Experience with the old form of Government contract shows that it is not always expedient to reject poor coal, because of the difficulty, delay and cost of removal. Under the present system rejectable coal may be accepted at a greatly reduced price.

"A definite basis for the cancellation of contract is provided.

"The constant inspection and analysis of the coal delivered furnishes a check on the practical results obtained in burning the coal."

Court of Honor—All Concrete
Alaska-Yukon-Pacific Exposition



Concrete at the Alaska-Yukon-Pacific Exposition

REINFORCED concrete and cement stucco are used extensively in the buildings and surroundings at the Alaska-Yukon-Pacific Exposition and several of the buildings are shown herewith by courtesy of Concrete. The Court of Honor afforded an opportunity for artistic treatment in cement, and various ornamental pieces throughout the grounds will prove interesting to the general public as well as to the concrete man who visits the exposition.



California Building

The danger of a conflagration is reduced to the minimum where concrete buildings form a good part of the works, and this feature is one not to be overlooked in an institution where thousands of people will be in attendance daily. The matter of permanency is also of considerable importance.



Hawaiian Building

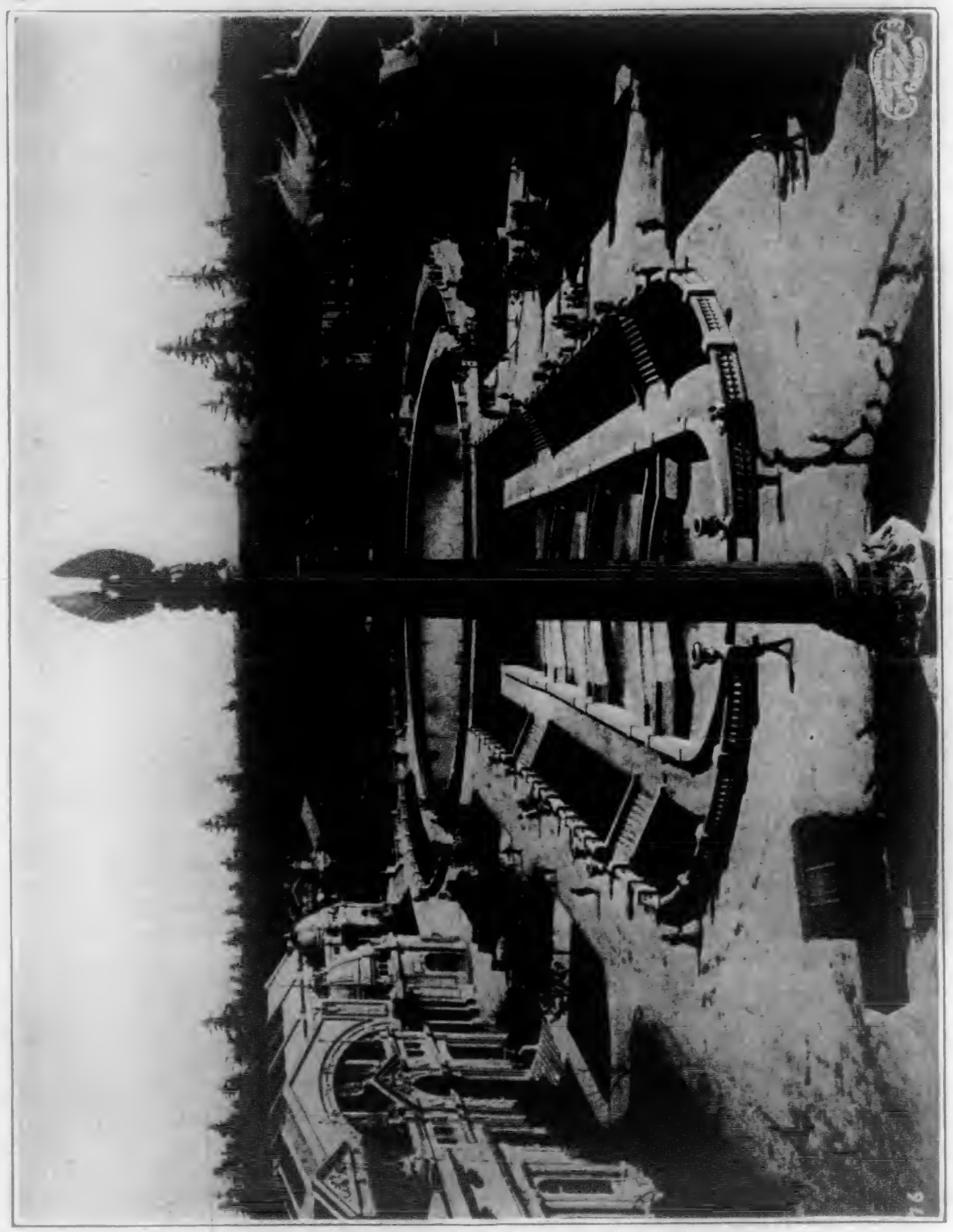
At the Chicago world's fair, the only permanent building erected was the Museum of Art, which was built of stone. The preservation of the valuable paintings and other works of art demanded a fire-proof structure. At the St. Louis Exposition, many permanent buildings were erected, and at the conclusion of the show, by previous arrangement, they were turned over to the University, and are still being used.



Ornamental Work

The officials having in charge the construction of the buildings and other structures at the Alaska-Yukon-Pacific Exposition, have made a similar arrangement with the Uni-

Court of Honor—All Concrete
Alaska-Yukon-Pacific Exposition



Concrete at the Alaska-Yukon-Pacific Exposition

REINFORCED concrete and cement stucco are used extensively in the buildings and surroundings at the Alaska-Yukon-Pacific Exposition and several of the buildings are shown herewith by courtesy of Concrete. The Court of Honor afforded an opportunity for artistic treatment in cement, and various ornamental pieces throughout the grounds will prove interesting to the general public as well as to the concrete man who visits the exposition.



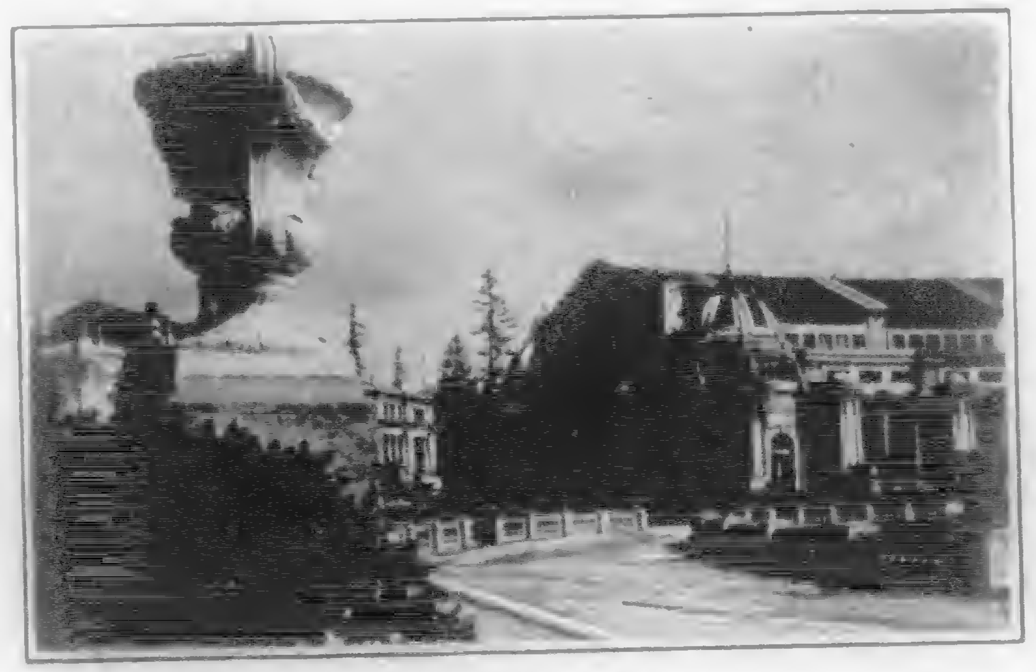
California Building

The danger of a conflagration is reduced to the minimum where concrete buildings form a good part of the works, and this feature is one not to be overlooked in an institution where thousands of people will be in attendance daily. The matter of permanency is also of considerable importance.



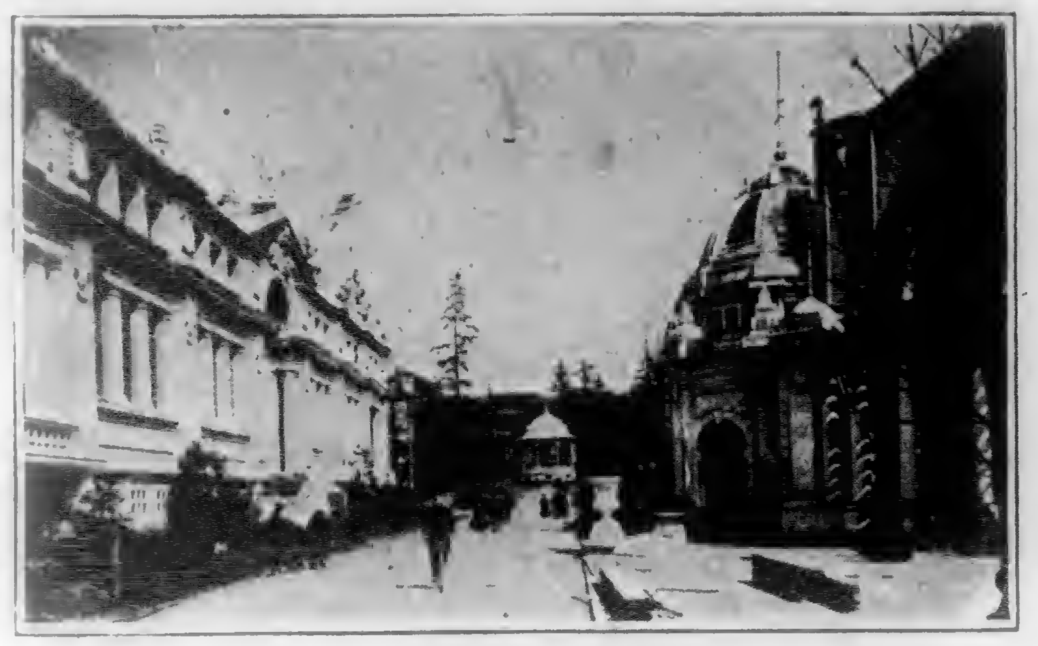
Hawaiian Building

At the Chicago world's fair, the only permanent building erected was the Museum of Art, which was built of stone. The preservation of the valuable paintings and other works of art demanded a fire-proof structure. At the St. Louis Exposition, many permanent buildings were erected, and at the conclusion of the show, by previous arrangement, they were turned over to the University, and are still being used.



Ornamental Work

The officials having in charge the construction of the buildings and other structures at the Alaska-Yukon-Pacific Exposition, have made a similar arrangement with the Uni-



Yukon Avenue

versity of Washington. The California state building is a dignified edifice, built of concrete, following the simple lines of Mission architecture. The Washington state building, the American Woman's League headquarters, the Hawaiian building and many others are of concrete construction.

* * *

The Architect's Approval as a Condition to the Contractor's Right to Compensation

By JOHN EDSON BRADY, of the New York Bar

WHERE a building contract merely requires the contractor to perform the work according to the plans and specifications it is not necessary, of course, in case the work is so performed, that it should also be performed to the satisfaction of, or obtain the unqualified approval of, the owner, the architect, or anybody else. The contractor is entitled to his pay if the plans have been complied with substantially. In many building contracts it is provided that the work shall be done to the owner's satisfaction, and these provisions have in general been construed, not as making the owner's declaration of dissatisfaction conclusive, but as calling for such work as ought reasonably to satisfy the owner. The law regards the owner as having undertaken to act fairly and reasonably, and for the purpose of preventing injustice it is held that, under such a provision, the contractor is entitled to recover from the owner, for whom he has worked, if the owner ought, as a reasonable man, to be satisfied with the work. More frequently the building contract provides that the work shall meet the approval of the architect or engineer. These provisions are generally, in the absence of fraud, held binding and the right to compensation is made subject to such approval.

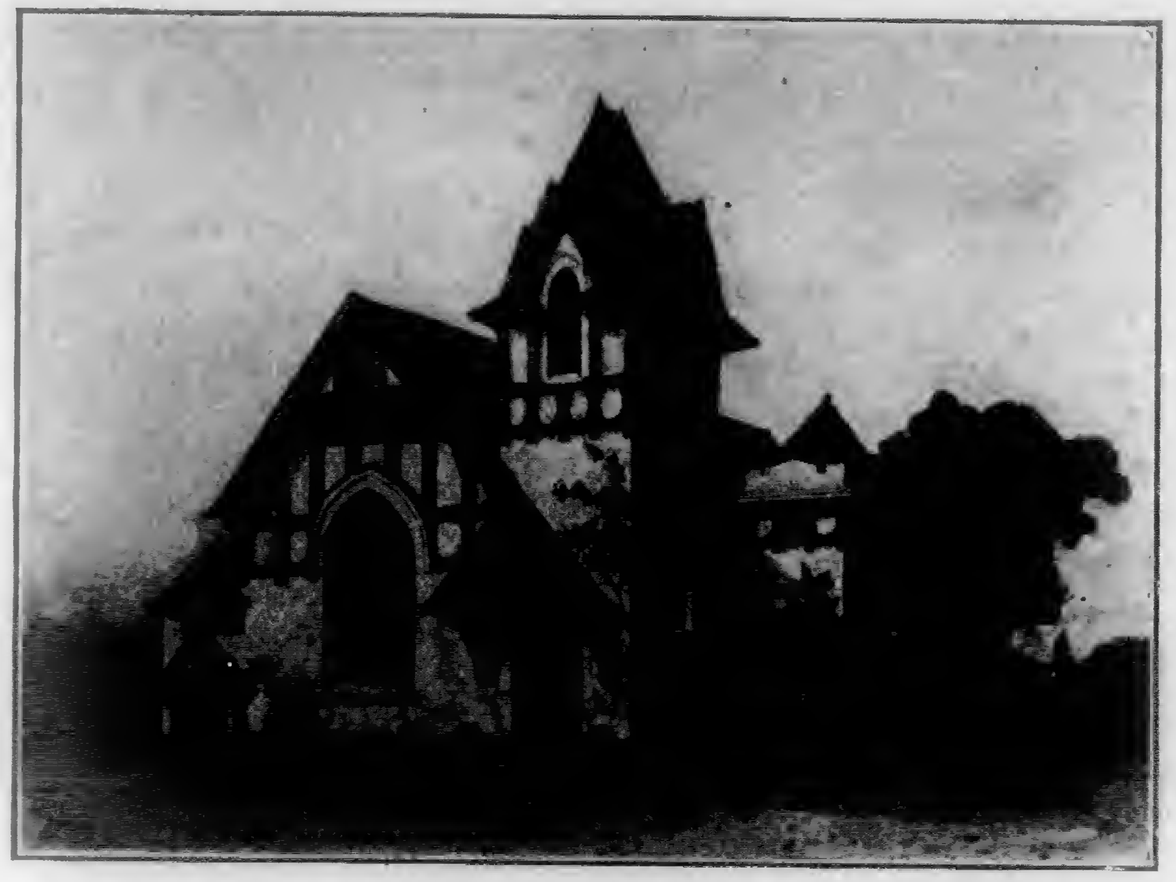
Provisions of this kind have been upheld in numerous cases. In Corey vs. Lehman, the contract involved being one for mason work upon certain buildings, there was a provision in the contract that the work should be paid for as it progressed. But fifteen per cent of the contract price was to be held back until the work was finished and accepted by the superintending architect. The work was completed and the buildings turned over to the owner, but the architect refused to give his certificate on the ground that the work was unsatisfactorily done. Eighty-five per cent of the contract price had been paid and in a suit for the unpaid fifteen per cent, brought without having obtained the architect's certificate, it was held that the contractor could not recover. Courts are powerless to disregard the terms of a written contract plainly expressed. In a contract with the United States for the construction of a wall it was provided that payment for the work would not be made until an agent designated by the United States should certify that the work was completed in all respects as contracted for. When the wall was finished the architect refused to issue his certificate, claiming

that the building contract had been disregarded both as to material and as to construction. The wall was taken down and rebuilt by other parties at a cost of about eight thousand dollars and the contractor received nothing for his labor and material. Sweeney vs. United States, 109 U. S. 618.

When a contractor, having agreed to complete certain work to the satisfaction of the architect, lets out a portion of the work to a sub-contractor, and the architect refuses to accept the sub-contractor's work upon just grounds, an interesting question arises as to the right of the sub-contractor to be paid for his labor. The contractor for the Albany Savings Bank, at Albany, N. Y., employed a sub-contractor to manufacture and put in the bronze fittings and partitions. The contractor gave the sub-contractor specific instructions as to what was wanted and the sub-contractor began the work. When it was partly finished a representative of the owners called upon the sub-contractor and told him that he had better stop all "drawn work" and go ahead with the "cast work" only. He told the sub-contractor that, although it was a first-class job of its kind, it was not what the architect wanted and that it would not be accepted. The sub-contractor, not knowing what was wanted by the architect, was compelled to stop the work. Then two actions were started between the contractor and the sub-contractor, each being plaintiff in one of the actions. The contractor complained that the work was not acceptable by the architect and that, therefore, the sub-contractor had made a breach of his contract. The ground of the sub-contractor's action was that he had followed the directions of the contractor and had been stopped in the midst of the work. It was undisputed that the bronze work did not meet the requirements of the specifications and that the contractor was not in a position to compel payment therefore by the owners. And it was held that the contractor had no cause of action against the sub-contractor and that the latter was entitled to the amount agreed upon as compensation for the work. It was competent for the contractor to make a construction of the plans and specifications according to his own ideas, without reference to the architect, and this was exactly what he did. The sub-contractor, having followed this construction and lived up to the instructions of the contractor, could not be deprived of the money which he had earned even though the architect had refused to accept the work. The architect's refusal was a matter between the owner and contractor with which the sub-contractor had nothing to do. Woarms vs. Becker, 84 N. Y. App. Div. 491.

There are numerous exceptions to the rule that where a building contract provides that the work shall not be paid for without the architect's approval the securing of such approval is a condition precedent to the contractor's right to recover. The production of the certificate of the architect may be excused on the ground that the condition making it a necessity never arose. Thus, where a contractor brought suit to recover for iron work which he had manufactured and put up, and the building was destroyed before completion through no fault of the contractor's, it was held that the contemplated condition, upon which the certificate might be demanded, did not arise and that the contractor might recover the contract price irrespective of the architect's sanction or approval. Rawson vs. Clark, 78 Ill. 656.

The production of the architect's certificate may also be excused through the fault of the owner or the agent of the owner. In an action by a city contractor against the City of Brooklyn, who had been driven from the work by the agents of the city, it was held that he might recover for the work done although he had not obtained the certificate as required by the contract. Kingsley vs. City of Brooklyn, 78 N. Y. 200.



Design for a Church
C. P. Ripley, Architect



Mission Apartment House for Mr. Slueter, Oakland
J. B. Ogborn, Designer

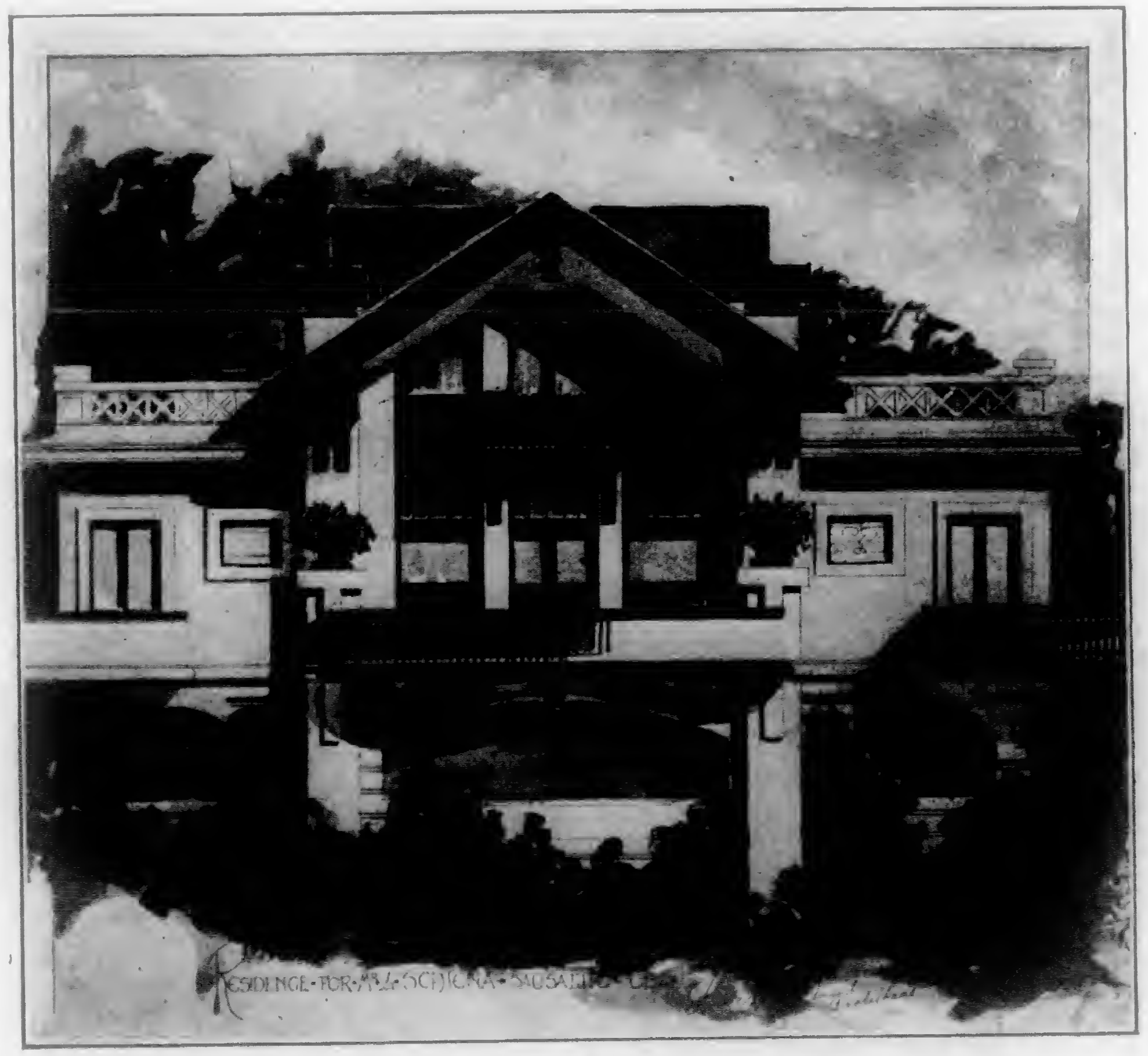
* * *

Now the Clay Railroad Tie

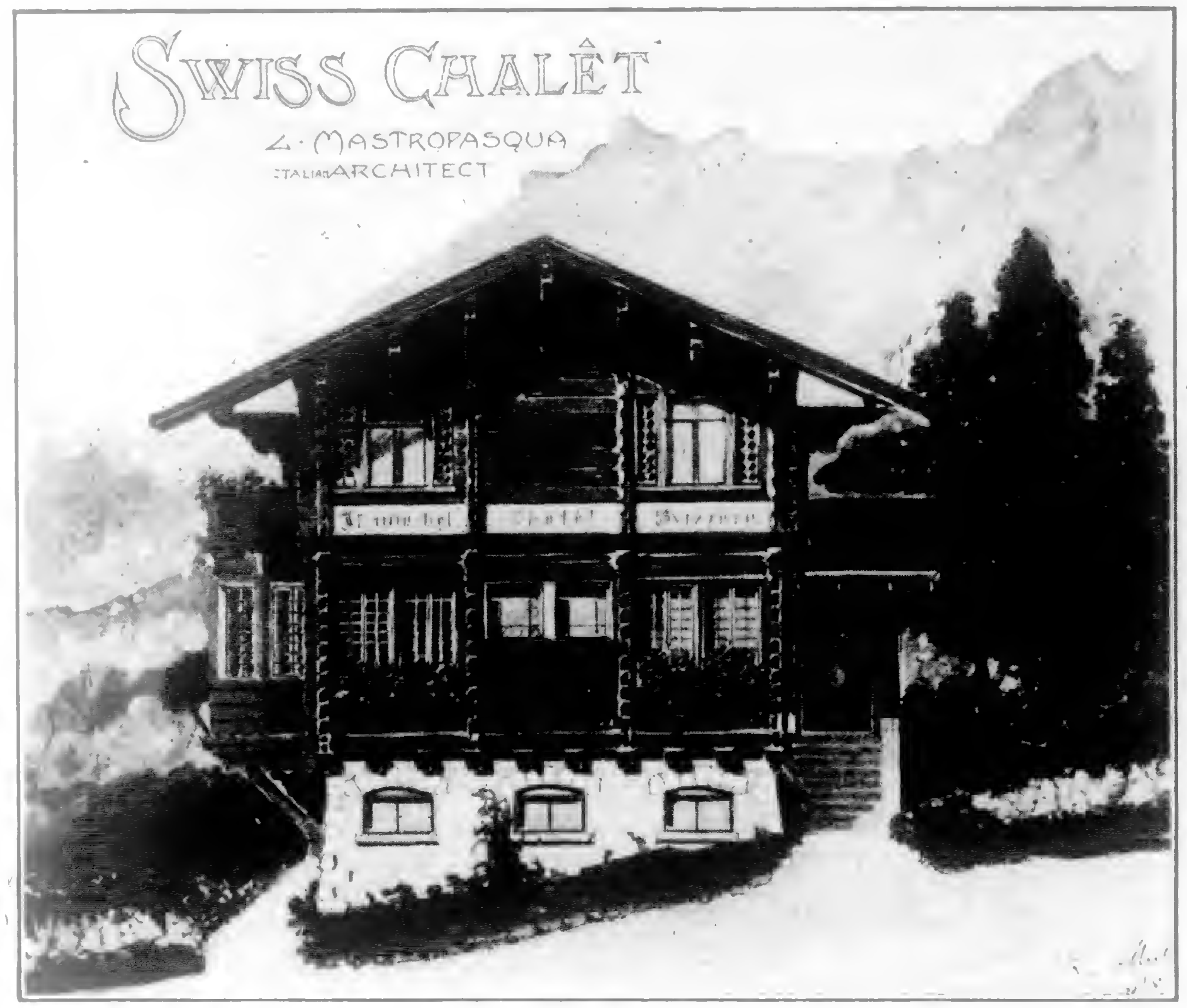
John Murphy of the Murphy Grout Company, Columbus, O., has devised a patent tie made of clay for railroads. A sample car load of the ties was made at the plant of the Wassall Brick Company and shipped to Columbus. Within the next few weeks these ties will be given a thorough test by the Hocking Valley Railroad in Columbus.

The ties are made from the same quality of material as the Wassall paving block and are burned in the kilns. An iron rod passes through each tie from end to end. When the ties are laid in the road bed they are placed on a patent cushion that takes up the jar caused by the trains passing over them. The first idea of the inventor was to use cement in the manufacture of the tie, but this was given up because of the cost.

SOME RECENT WORK
BY
L. MASTROPASQUA
ITALIAN ARCHITECT
SAN FRANCISCO



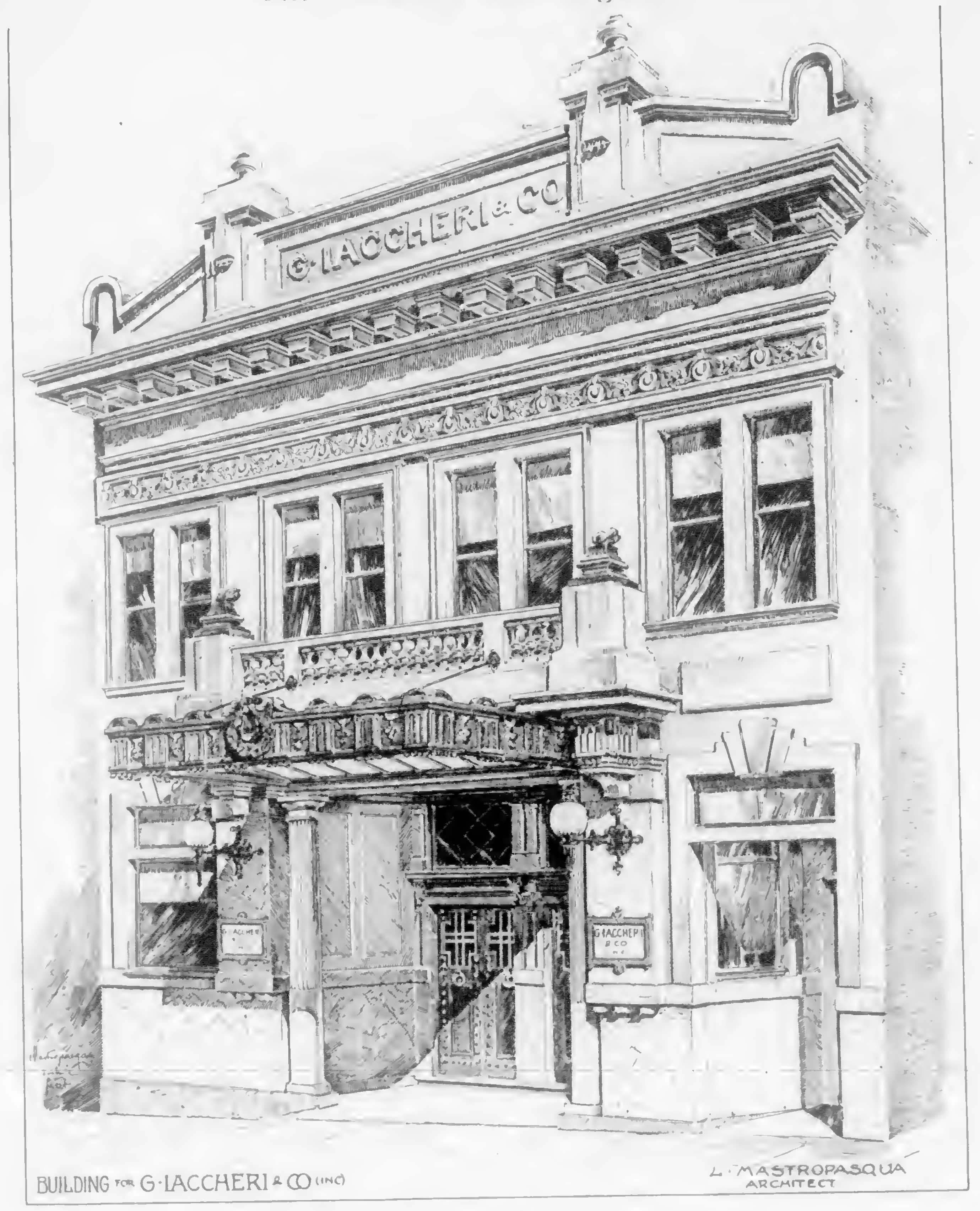
Residence for Mr. L. Scaiena, Sausalito, Cal.
L. Mastropasqua, Architect



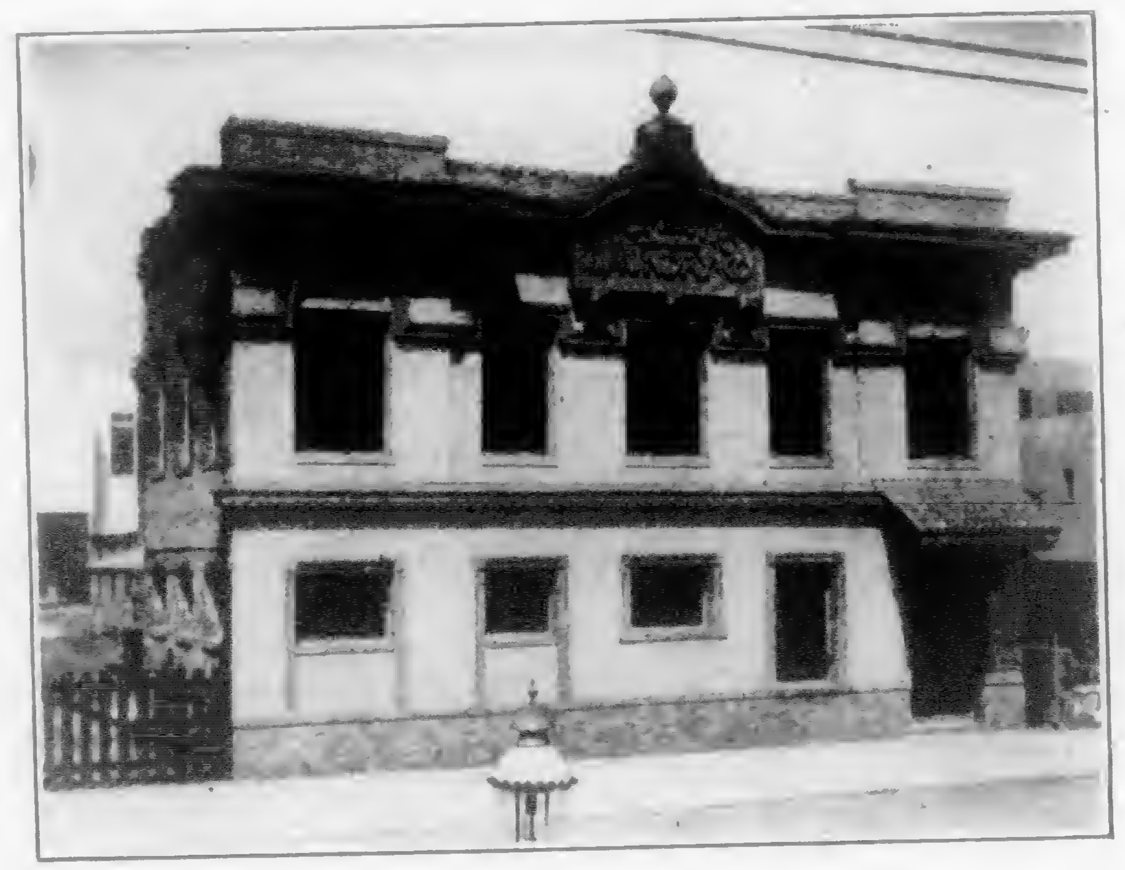
Design for Swiss Chalet, L. Mastropasqua, Architect



Dining Room in House of Architect L. Mastropasqua, San Francisco



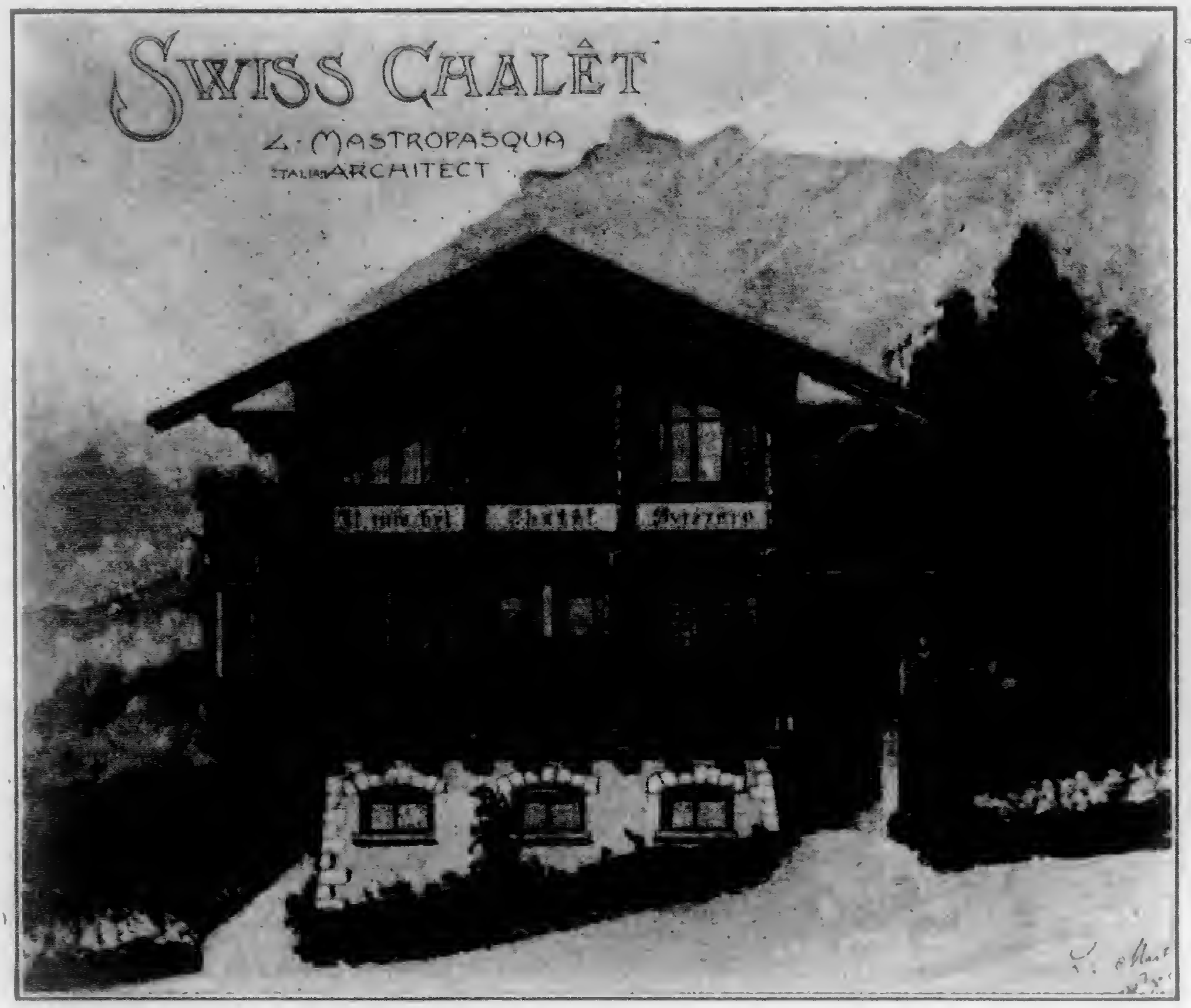
Building of G. Iaccheri & Co., San Francisco
L. Mastropasqua, Architect



Domestic Laundry Building

San Francisco

L. Mastropasqua Architect



Design for Swiss Chalet, L. Mastropasqua, Architect



Dining Room in House of Architect L. Mastropasqua, San Francisco



Building of G. Iaccheri & Co., San Francisco
L. Mastropasqua, Architect



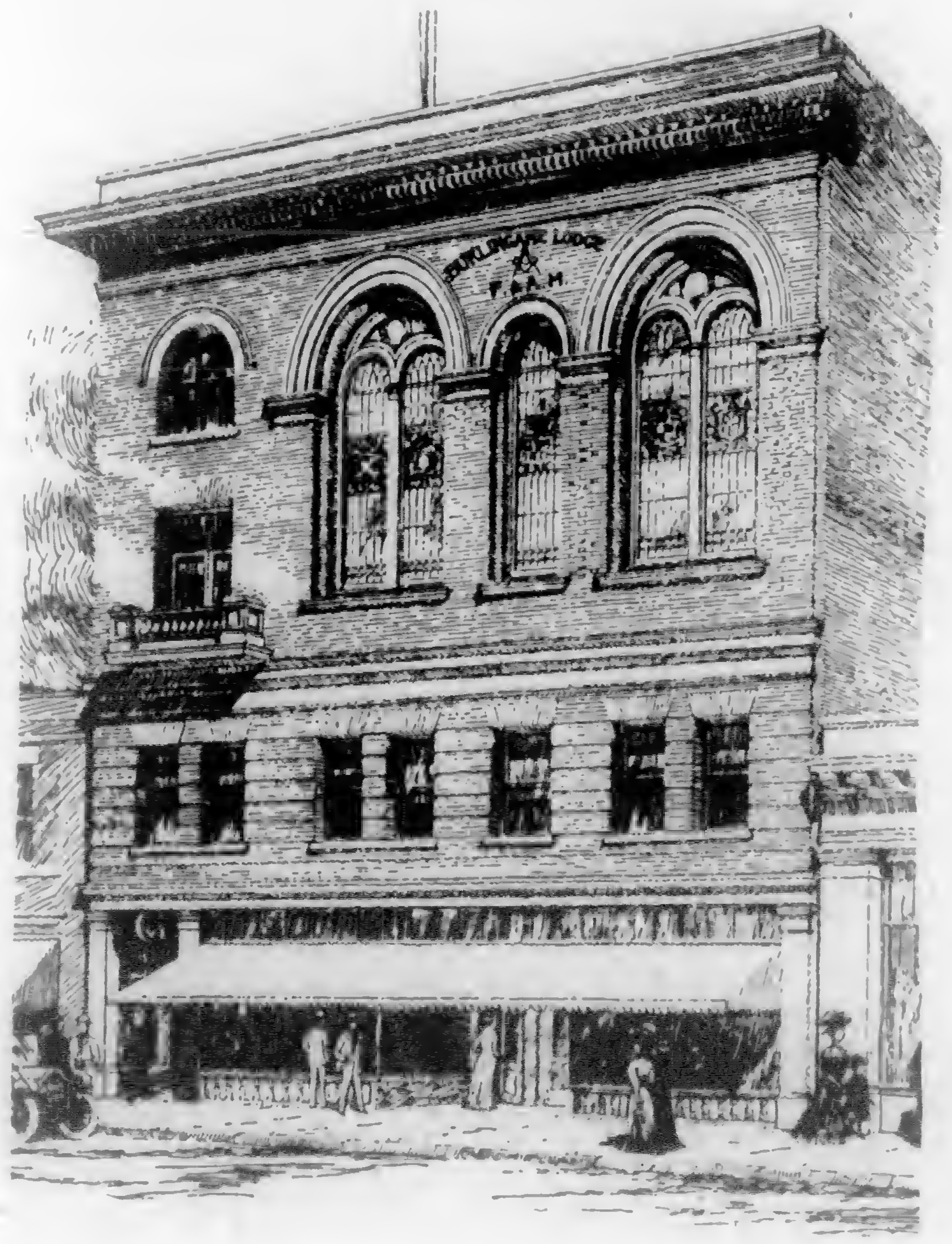
Domestic Laundry Building

San Francisco

L. Mastropasqua Architect



The First Reinforced Concrete Building Erected in San Francisco after the Fire of 1906



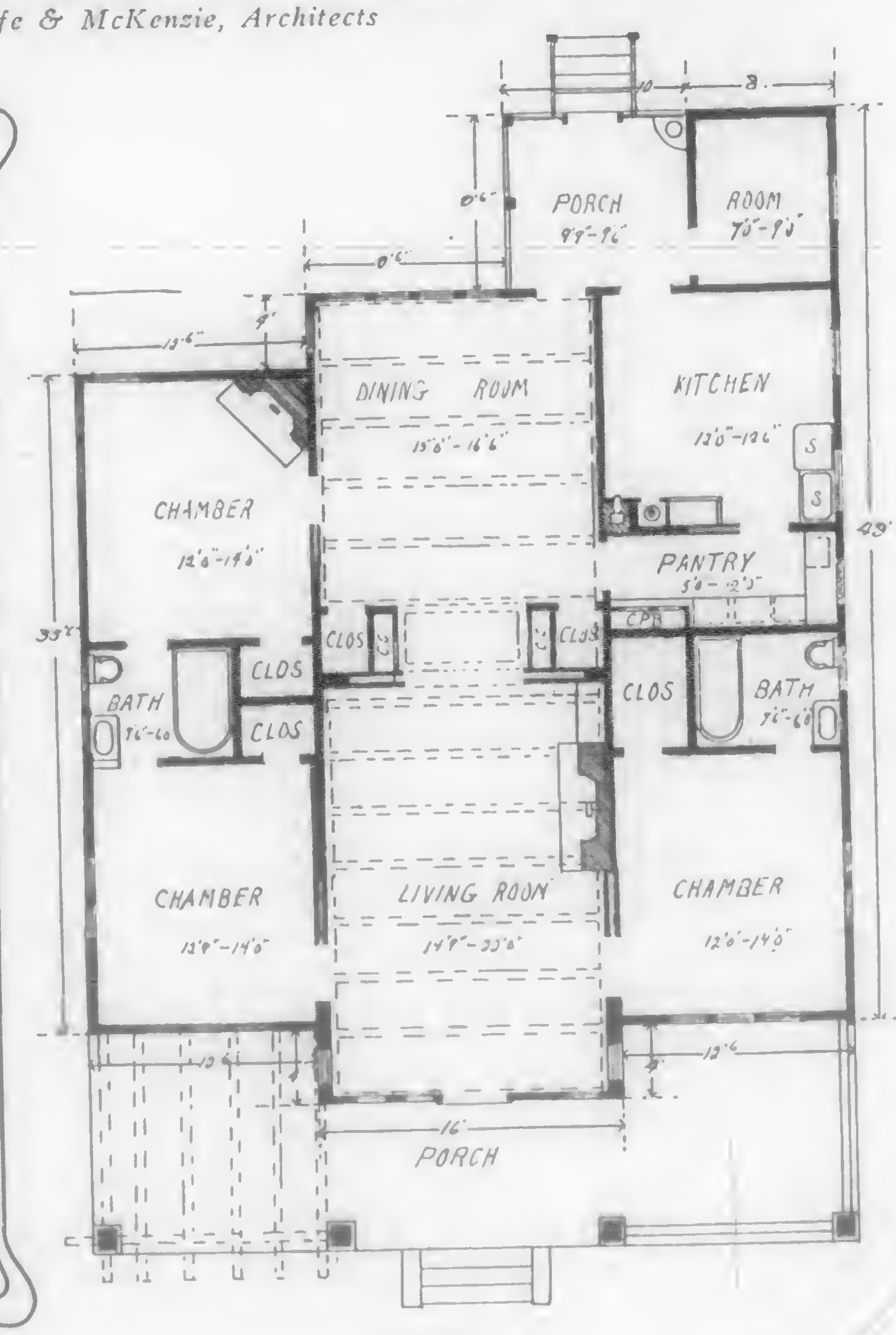
Masonic Temple. Burlingame Cal.

Thomas Smith Architect



Bungalow of Mr. Henry Lion, San Jose
Wolfe & McKenzie, Architects

Floor Plan, Bungalow of Mr. Henry Lion, San Jose
Wolfe & McKenzie Architects
Concrete Foundations, Shingled Sides and Roof
Cost $4,500



FLOOR PLAN

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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OFFICERS FOR 1909

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Competition for Architectural Students.

THE Architect and Engineer will give five prizes to the five best designs offered for a boat house to be built at Lake Merritt, Oakland, under the direction of the Mayor and Park Commissioners of that city. The building is to cost not over $25,000. The competition is to be open only to architectural students, whether in architect's offices or in colleges in California, Oregon, Washington, Nevada and Utah.

No architect may compete.

The boat house is to be on the Twelfth street boulevard, Oakland, on the north side of the street, which is filled or "made land," and incloses an arm of the bay, which is called Lake Merritt; the boat house is to face Peralta Park on the

south, which park is now being graded. The building, of fireproof construction (reinforced concrete preferred), to rest upon concrete piles. The exterior design and arrangement is to be left to the competitors, the committee only requiring that the building be of two stories, with gallery or balcony on upper story, and that provision be made for an office, men's and women's dressing rooms, repair shop, lockers, lunch room, spacious lounging room, large float, with stairs leading from float to first story of boat house; provision should also be made for flag poles, or other arrangements for display of flags and for living rooms, on the upper story, for the family of the boat house keeper.

The drawings should be made on a scale of one-eighth inch to one foot, on white Whatman paper and to consist of:

Foundation plan,
First floor plan,
Second floor plan,
Section through building,
Four elevations, all in black ink, and no coloring.

Perspectives, while not required, will be used for reproduction, if they possess merit.

Five prizes will be awarded as follows:

For the best design, a Bostrom level, value $25.

For the second best design, a set of K. & E. drawing instruments, value $15.

For the third best design, a set of scale rules, in case; value $10.

For the fourth best design, a set of triangles, value $7.50.

For the fifth best design, a Ferguson fountain draughting pen, value $5.

The design must be delivered personally or forwarded by mail, prepaid, addressed to "Competition Editor, The Architect and Engineer, 621 Monadnock building, San Francisco, Cal.," and must be received not later than October 15, 1909.

To Test Validity of Burnett Act.

San Francisco Chapter, A. I. A., has appointed a committee to investigate the Burnett Tenement House act and secure, if possible, a ruling on the constitutionality of the act. City Attorney Percy V. Long writes that so far, no action has been commenced in San Francisco. He speaks of the Aden case which arose prior to the Burnett act coming into effect, and was brought to test the constitutionality of a provision of our ordinance regulating the construction of tenement houses.

It was contended in that case that under the facts of that particular case the requirements of that ordinance that a twelve-foot yard space should be left in constructing a tenement house on a lot 120 feet in depth running from street to street, the rear street being 23 feet in depth, was unreasonable.

There were peculiar facts surrounding that case and Judge Troutt, after hearing the case, was of the opinion that the particular provision of the ordinance in question worked an unnecessary and unreasonable hardship upon the plaintiffs and owners of the lot.

This was the last permit to be issued under the old ordinance, which was repealed by the Burnett act.

A great many builders have complained of the operation of the act, and it is hoped no time will be lost in testing its constitutionality. The City Attorney states that he has rendered an opinion to the Board of Public Works that ordinary flats, including the Romeo flats, do not come within the operation of the statute.

Planned Lay-Out of Alaska-Yukon-Pacific Exposition.

Seattle visitors, in showering praise over the exquisite harmony and artistic beauty of the Alaska-Yukon-Pacific Exposition buildings and grounds, are paying a nice compliment to the designer of the grounds, buildings, monuments, etc—E. Frere Champney, formerly with Howard & Galloway of San Francisco. The latter must have the credit of the exposition lay-out and the chief designs, of course, as all work passed through their offices—for they were the official architects, and due regard must also be given to the work of the several states, foreign, national and local firms, who labored in such harmony, that the exposition suffers from very little incongruity of design, within the grounds. Champney is quite well known in San Francisco and Berkeley.

E. Frere Champney was born in France in 1874, and is a son of the artist, J. Wells Champney, whose landscapes in oil grace many of the noted art galleries of Europe and America. After graduation at Harvard in 1896, he studied architecture at the Ecole des Beaux Arts, Paris—giving especial study during his last year to the French Exposition of 1900. On his return to America he entered the office of Carrere & Hastings, as designer of their work for the Pan-American Exposition.

In 1907 he entered the office of Messrs. Howard & Galloway, and has since been in charge of their Seattle office, as chief designer for the Alaska-Yukon-Pacific Exposition. Champney is an authority on modern exposition design and technique; through the advantages of long study and world-wide travel. As the Seattle fair and his work in previous expositions prove, he exhibits a wonderful genius for combining art with nature, of

creating the most artistic types of buildings for specified purpose and place, and of reproducing touches of form, color, mass and design with charming effect, that suggests a combination of European and American motives—all adapted to the most modern methods of construction and specifications. California and the Pacific Coast will follow the future of this artist architect with much interest.

Coming Architectural Exhibition.

President Willis Polk has sent out the following:

"This is the initial announcement of the first annual exhibitions of The Architectural League of the Pacific Coast. These will be held in four coast cities this fall and winter.

"The first exhibition will be in San Francisco, under the auspices of the San Francisco Architectural Club early in October. The first annual convention of the A. L. P. C. will be held at that time.

"We hope you will have some interesting drawings to exhibit. These must be ready by September 10th. Kindly notify August G. Headman, president of the San Francisco Architectural Club, 1626 Phelan Bldg., if you are willing to exhibit your work.

"Information regarding the requirements necessary and dates that jury of the exhibition committee will meet, also exact dates and location of the exhibition, will be forwarded to you by the exhibition committee of the San Francisco Architectural Club upon request."

The following additional information is supplied by the publicity committee:

"The exhibition will open to the public October 19th and run until October 31st. This will be the fourth annual exhibition of the San Francisco Architectural Club. In addition to the work of the local architects there will be drawings sent by the leading architects in the cities west of Denver, and about forty of the leading men in Boston, New York, Philadelphia, Washington and Chicago.

"The object of the exhibition is to allow the public to see the progress that is being made in architectural design in various parts of the country."

Christian Science Church.

The members of the First Church of Christ, Scientists, San Francisco, are negotiating for the purchase of a lot on the north-east corner of California and Franklin streets, as a site for a church. Plans for a handsome edifice were prepared by Architect Jno. Galen Howard before the fire in 1906, since which time nothing has been done towards building. It is understood that plans have lately been prepared by Architect Edgar Matthews and that these drawings are now in the hands of the building committee. It is proposed to spend $200,000 in the construction of a handsome edifice.

San Francisco Chapter, A. I. A.

The regular quarterly meeting of the San Francisco Chapter, American Institute of Architects, was held in the green room of the Hotel St. Francis, on the evening of July 15th.

In the absence of Mr. Albert Pissis the meeting was called to order by William Mooser. The attendance was twenty-two.

Messrs. John O. Lofquist, Norman W. Sexton, Arthur D. Nicholson and William A. Newman were elected to chapter membership.

The following names were placed in nomination as officers of the chapter for the ensuing year:

President, William Mooser; vice-president, Louis C. Mullgardt; secretary-treasurer, Sylvain Schnaittacher; trustees, William Curlett and Henry A. Schulze.

A committee was appointed to take steps toward having the American Institute of Architects meet in San Francisco during the Portola Festival. Also a committee was appointed to investigate the state tenement house law and to report to the chapter.

Fairfield Court House Plans.

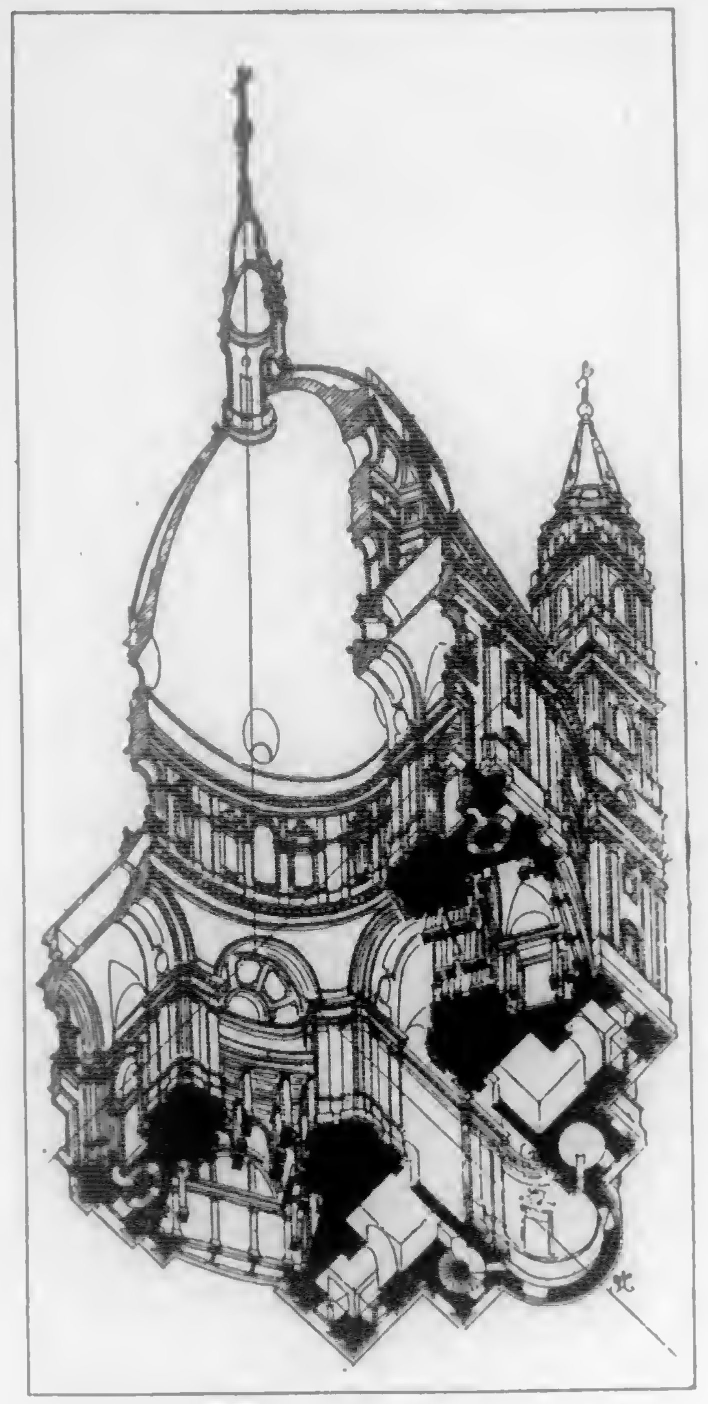
Fairfield, Solano County, Cal., is to have a $250,000 court house. Competitive plans were submitted to the Supervisors recently by the following architects: Sellon & Hemmings of Sacramento, J. W. Dolliver, W. J. Cuthbertson and A. C. Lutgens of San Francisco and J. W. Jones of Vallejo. The above were invited to submit plans. Architects William Mooser of San Francisco and R. A. Herold of Sacramento submitted sketches without invitation.

$100,000 Concrete Residence.

Architect William Curlett and Son of San Francisco, are preparing plans for one of the largest reinforced concrete residences ever built on the Pacific Coast. It is planned to make the house proof against both fire and earthquake. Mrs. Theodore F. Payne is the prospective owner and the location is near Menlo Park, San Mateo County. The house will cost over $100,000.

Native Sons' Building.

Architect Headman, Regetti and Hildebrand are completing the working drawings for the Native Sons' Building, San Francisco, and ground will be broken on Admission Day, September 9th. The structure will be Class A and will represent an outlay of more than $100,000.



What Is an Architect?

"WHAT is an architect?" is a conundrum that has long "stumped" those to whom it has been put. The practitioners of the law—who ordinarily set themselves, sooner or later, to decide upon a definition for all words of the English language!—have not yet ventured to establish the limits of this profession. Possibly one test that might be used would be the drawing we reproduce upon this page. It might, with equal discrimination, be termed an architectural "picture puzzle;" which the professional magazines have so far neglected to discover and to print. A careful study will prove that it contains within itself a plan, exterior and interior elevations in four or five different planes, several sections, isometric and stereotomical; while still other wonders may be discovered by the careful and diligent observer. Only a regard for the sanity of our subscribers prevents our instituting a prize for whoever would trace down and capture the greatest number of live vanishing-points expressed upon this picture!

San Francisco Architectural Club.

By E. H. Hildebrand.

The work of the committee composed of Clarence R. Ward (chairman), W. H. Crim, A. O. Johnson, George Wagner, T. Bearwald and E. H. Hildebrand, appointed by President Headman of the San Francisco Architectural Club for the purpose of broadening the scope of the work of the San Francisco Architectural Club and organizing the Architectural League of the Pacific Coast, is so commendable that it is of interest to the entire coast.

The San Francisco Architectural Club has always stood for educational work among its members and for the betterment of the profession. By the strengthening of the club with the large increase in its membership through the addition of many of the leading architects of the city, and the wide spreading influence of the Architectural League of the Pacific Coast, which is composed of the architectural clubs of the entire coast, the San Francisco Architectural Club will be able to extend its work and usefulness. The formationof the league is bound to benefit the educational, social and essentially esthetic phases of architecture, as it is the aim of the league to organize various classes in the different architectural clubs of the Pacific Coast, whose work will be sent to San Francisco for judgment by local architects, just as the work of the architectural clubs in the East is sent to New York for judgment. This plan will be especially beneficial to the San Francisco men, as they can then compare their work with that of the men of the entire coast.

If this were the only purpose of the club and the league, the profession as well as the public should take a lively interest in it, as it is from the ranks of such bodies that the cities must recruit the architects of the future and obtain trained men for the solutions of its esthetic problems.

SPECIAL NOTICE.

We wish to state that the so-called Architectural League of San Francisco has no connection whatever with the San Francisco Architectural Club, or the Architectural League of the Pacific Coast, and has no interest in or authority to solicit business for the coming exhibitions to be held under the auspices of these organizations.

SAN FRANCISCO ARCHITECTURAL CLUB,
By August G. Headman, Pres.

ARCHITECTURAL LEAGUE OF THE PACIFIC COAST,
By Willis Polk, Pres.

THE
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OF CALIFORNIA
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Vol. XVIII. August, 1909 No. 1.

PANEL WORK HERE TO STAY.

Much of our modern day taste is turning to mission and gothic styles in construction, and more particularly to the decoration of the interior of our homes, and the panelling effect somehow harmonizes to a great extent with this newer idea. It adds a certain dignity to the appearance of the abode, and at the same time gives it a homelike effect that is restful and comforting. It takes one back to the days when the "Knights were bold," and history was being made of the kind that we like to revel in. It makes the home more inviting, and there is likelihood of this idea becoming more prevalent in the future.

The use of panels seems to be one of the features that will not be a fad, but one that will rather add to the comfort of our structures and give them more the appearance of what a home should in reality be for each of us.

ADVANCEMENT IN APARTMENT HOUSE CONSTRUCTION.

Probably no one city in the world is destined to see as much apartment house construction as San Francisco in the next year or two. The city has been building sky scrapers—office buildings, principally—for three years. Various clubs are now putting up new homes and the municipality is restoring or replacing its burned schools, libraries, Hall of Justice, etc. The churches, too, have been active in construction work. To make the rebuilding of the city complete a large number of apartment houses must be built. Some already have been erected, while others are on the way. That these buildings may be up-to-date San Francisco architects are casting about for new features which are welcomed by both the owner and the tenant. One of the most popular of recent innovations in apartment house construction on the Pacific coast is the use of a long public hall on each floor. These

hallways tend to give the building the air of a hotel, without any degree of privacy. To overcome this the apartments in the buildings that are high enough to necessitate elevators are being so arranged that the elevator door opens right in a private vestibule of each separate apartment.

The two most notable examples of this new arrangement are the Van Dyke and Severn apartments, recently erected in New York. In the Severn no public hall above the first floor is used by more than two families, while in the Van Dyke there are no public halls, as in each apartment the entrance is direct from the elevator into a private vestibule.

In California the mission type of construction adapted to modern ideas of fitness and convenience has been chosen for a number of apartment buildings. The ground terrace is laid out with lawns and planted palms and the one above is laid out as a garden, the walks are paved in large tile of a warm, brownish red, and each apartment is supplied with an abundance of flower boxes and balconies. The exterior walls of the flat are finished in klinker brick and cement, with solid redwood beams and cornices left natural. Bright red tiles cover the roof, making a very striking color combination.

Each apartment has its individual entrance from the exterior opening into a spacious reception hall and living-room with large inglenook fireplace, with heavy seats built in.

The interior is carried out entirely in mission treatment with heavy beam ceilings and penciling on severely simple lines. An intercommunicating telephone system is installed, as well as hot water heating.

San Francisco's latest apartment building is the St. Charles, in perpetuation of the well-known hotel of similar name which stood upon the site before its destruction in the great fire. It is four stories and basement in height, and constructed of brick for the first story and frame for the upper ones. There are 140 rooms in all, divided into apartments of three, four and five rooms and bath each.

Every apartment opens into a private hall. A large interior court affords the maximum of sunlight and ventilation. The entrance is especially attractive, and opens into a large and beautifully decorated hall for receptions. A feature is a palm room for general entertainment.

The interior is equipped with every modern device for economizing labor, provided with electric elevators, heating plant, telephones and laundry.

The Lyndon apartment, St. Louis, contains some new features in apartment house economy. One of these is the absence of a parlor with each apartment and in its place is substituted a large living room finely equipped and finished in Flemish or old Dutch effect, and supplied with sideboards with mirrors.

Another feature is a new variety of brick used in the construction, which is a sand-mold red brick, made in northern Indiana. The brick is laid in heavy black mortar, with tool joints, giving the walls an artistic rough finish. The basement wall is of rough-faced stone and all entrances and window trimmings will be of similar material. Ornaments above the roof are of terra cotta. There are twenty-four apartments of four, five and six rooms, and equipped with all the modern improvements, including wall safes, telephones, clothes driers, sanitary plumbing, steam heat, etc.

A Story With a Moral.

There was a man in our town,
And he was wondrous wise.
When business got a little dull
He'd always advertise.

And when his godds were all sold out,
With all his might and main
He'd hustle 'round and get some more,
And advertise again.

And now that man is very rich,
And he has just retired;
While the firms that didn't advertise
Have most of them expired.

—Somerville Journal.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

Progress in Incandescent Gas Lighting.

THOMAS J. LITTLE, JR., in the Illuminating Engineer.

DURING the past year there has been a marked increase in the use of the inverted system—not because the total flux from an inverted mantle is more than that from the upright, but because the greater part of the light is in the lower hemisphere, and the ordinary user thereby gets greater satisfaction, even though no attention be paid to reflecting shades of any kind. The commoner types of glassware which are used on the cheaper burners cannot be considered to aid in directing the light, but, rather, serve only to protect the mantles from air currents. Even with this type of globe a better lighting effect is obtained than would be with a straight glass chimney in an upright burner. The reflectors have been found, however, to be extremely useful when properly applied to inverted burners. This is particularly marked in the lighting of store windows where high concentrating reflectors are very desirable. The inverted mantle being of rather small dimension, it is particularly susceptible to reflection, inasmuch as the light is now concentrated and consequently more nearly approaches the focus of the reflector, which cannot be said of other types of illuminants with rather an extended source.

It has been very generally demonstrated that the inverted mantles are very much stronger than the upright, and this allows of their being used in places where the vibration proves to be too great for the older type of upright mantles; its added strength is probably due to its smaller mass, and takes up the vibration from the fixture proper more readily than the longer hanging upright mantle; furthermore, the mantle is in itself attached rigidly to the carrying magnesia ring, and there is no swaying or bumping motion, as is the case with the upright, which so often causes it to crack and sometimes break off at the gauze line at top of burner.

Thousands of the passenger coaches in America are now lighted with the inverted gas system, and the standing orders on most of the larger roads are to the effect that all of the new coaches shall be so equipped, as well as coaches that are being renovated.

Gas illumination has paralleled the electric lighting in respect to fixture design. For instance, we see the metallic filament lamps being used on specially designed fixtures and the lamps equipped with prismatic glass reflectors. We see almost identical equipment used in inverted gas burners, the only difference being that the reflectors here used have been provided with non-breakable metallic necks, which will be found necessary on account of the high breakage where the glass necks were used. These inverted fixtures are self-lighting, with pilot system of ignition, by using a single chain suspended from the fixture controlling all burners.

In inverted cluster lamps a single piece

of glassware has not yet been sufficiently used to demonstrate its success, but indications are that this type of lamp will be very largely used, as was the upright type of cluster lamp known as the gas arc.

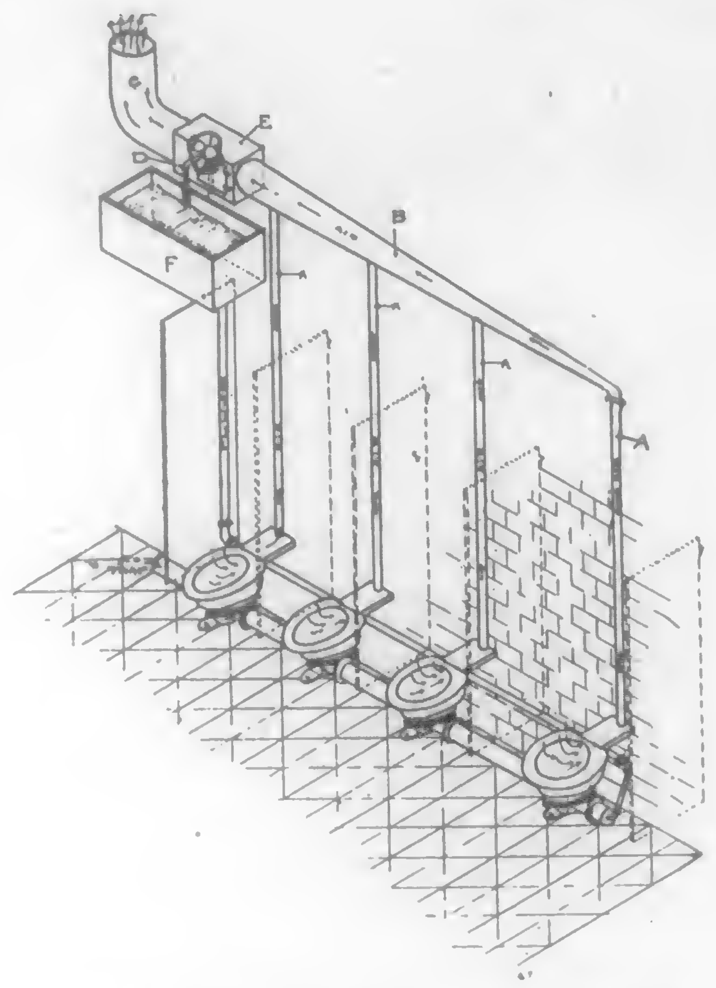
Illuminating engineering seems to play an important part in gas illumination, and some of the comparisons made between the cost of gas lighting and electric lighting are most interesting, but as both the electric and the gas systems are now using reflecting shades almost exclusively, these comparisons are very difficult to make directly, and while we may approximate illumination from a polar curve given out by a photometric laboratory if the distance from the plane to be illuminated to the light source be the same as was used in the laboratory in making the test, it by no means follows that for other distances simple calculations from these figures should always be correct; in other words, it would seem from the data at hand on lamps equipped with reflectors that we are limited to the calculation of illumination in spherical rooms only, and so it would seem that we must reform our testing methods by eliminating a great deal of our calculating and do more direct testing, in order that illuminating engineers may really know and determine accurately the comparative cost of illumination by means of the various types of gas and electric units now on the American market.

Fine School for San Leandro.

Architect William H. Weeks of San Francisco and Watsonville has prepared plans for a handsome brick school house for the town of San Leandro. It will cost $60,000.

Honor for Oakland Architects.

Architects Dickey & Reed of Oakland have been invited to submit competitive plans for the new government building in Honolulu. The sum of $800,000 has been appropriated for the building. Fifteen other architectural firms in the United States and Hawaiian Islands have been invited to compete.



The Smith Sanitary Toilet Ventilating System

A Novel Toilet Ventilating System.

ARCHITECT A. C. SMITH of Los Angeles has invented a new sanitary toilet system, which is destined to remove all objections heretofore made to placing toilets in basements or other parts of buildings. The plant is easily installed at comparatively small outlay, the expense of installation being the first and only cost. The plant will last for many years and does not cost anything for operation except for an occasional drop of oil.

The plant is easily understood by a glance at the architect's drawing. It consists of a row of toilets having local vents at the back, an automatic tank, a water motor with a fan, and piping connecting with the toilet vents and enclosing the fan, and extending out through the roof or side of the building.

The water motor and fan is placed above the flushing tank. The motor is connected with the main water supply pipe, and is allowed to run constantly during the time the toilet rooms may be occupied. The waste water is spilled directly into the automatic flushing tank, thus using the same water for operating the motor and fan and then for assisting in filling the flushing tank.

The principles employed in this system are the reverse of that used by other systems which have attempted to perfectly ventilate toilet rooms. The inventor has so arranged the piping connections and fan, that there is a constant vacuum in the rooms, created by the fan, exhausting the foul air through the toilets and thus drawing fresh air in through the doors and windows, leaving no possible chance for odors to appear even in the toilet rooms, because of the constant supply of fresh air being drawn into the rooms, and taken out through the toilets, under the seats.

Mr. Smith has installed this system in several school buildings with excellent results, and without any cost for operation.

Dissolve Partnership.

The firm of Sexton and Nickerson, with offices in the Chronicle Building, San Francisco, has dissolved partnership. Mr. Sexton retains the old offices.

Baseball by Electric Light.

The New York Sun published the following in a special telegram from its Cincinnati correspondent:

"Baseball by electric light had a thorough trial at National League Park here to-night and it seems to be a success. The infield and outfield were brilliantly illuminated by a battery of five mammoth lights installed by the inventor of the system, George A. Cahill of Holyoke, Mass., and flooded the field, making it almost as light as day. The game was played between teams representing the Elks lodges of Cincinnati and Newport, Ky., and was fast in all departments. The players handled hard infield hits with apparently as much certainty and ease as if they had been playing in the glare of noonday. What little difficulty there was experienced in judging balls fell to the outfielders, and those players missed but two out of a possible fourteen hits to the outfield during the seven innings played.

"President Garry Herrmann of the Cincinnati Reds said, after witnessing the game:

"'Night baseball has come to stay. It needs some little further development, but with proper lighting conditions—conditions better than this experiment provided—will see the night sports immensely popular.'

"Manager Clark Griffith of the Reds said:

"'I don't believe that night baseball is destined to rival the daylight article, but I will say I am much surprised at the ease with which the game was played to-night. Under improved lighting it will grow more popular.'

"A crowd of more than 4,500 persons saw the game."

Electrical Contractors as Illuminating Engineers.

AT the annual convention of the National Electrical Contractors' Association held recently, the necessity of the electrical contractor taking up illuminating engineering and the exceedingly profitable field that is open to those who become competent and proficient in this line, were discussed.

The commercial introduction of the new electric lamps, particularly the tungsten lamp, has to a large degree rendered every present electric lighting installation antiquated. To say nothing of the faults of the installations in themselves, therefore, it follows that almost without exception the electric installations at the present time could be remodeled to great advantage in point of efficiency and effectiveness of illuminating result. Furthermore, the majority of the present lighting installations are surely going to be



remodeled, and this remodeling is going to be done on an illuminating engineering basis. The day of "stringing wires" for electric light is rapidly passing. People have learned a lot about illumination in the past three years, and they are not going to submit to bungling and guesswork to any great extent hereafter.

In a nutshell it comes to this: Both new and old installations are to be put upon an engineering basis. Is the electrical contractor going to be a mere day laborer, working to the specifications of a professional illuminating engineer, or is he going to make himself competent to furnish the engineering skill as well as the craftsmanship?

At least for all ordinary installations of electric light the electrical contractor is the natural one to look to for illuminating engineering skill. This holds especially true in all the smaller cities and towns. The electrical contractor should be able to handle the illuminating problems incident to his work just as the local architect must be able to handle the structural and all other engineering problems connected with a building. But the knowledge of illuminating engineering must be real and thorough, and not merely assumed; while complicated and difficult problems are not so frequently met with in the smaller city or town, they will nevertheless sometimes occur. A public library, or school house, or church, or other public building may be erected, and public spirit and local pride will see that as much of the work as possible is done at home. The requisite theoretical or "book knowledge" is no more difficult to obtain than the necessary knowledge of electrical science; and the contractor who excuses himself on account of lack of time or opportunity to study the subject of illuminating engineering is deserving of no better consideration than would be given the physician who declined to treat certain diseases on the ground that he had no time to study their pathology.

On a guess The Illuminating Engineer declares that at least 75 per cent of the work of an electrical contractor is in the installation of lighting systems. He is, therefore, by force of circumstances, in the position of a constructing illuminating engineer, and in a majority of cases can scarcely escape responsibility for illuminating results obtained. Let every electrical contractor so consider himself and proceed to make himself competent and to justify the title with all possible diligence.

Proper Plans Needed for Plumbing Alterations.

In making extensive plumbing alterations it is wise to have a comprehensive plan prepared before letting the contract. The advantage of having well-prepared plumbing plans and specifications are sevenfold, says a competent engineer on this subject. There are many men of financial responsibility engaged in the plumbing business who do not possess sufficient skill and knowledge to properly lay out a system, and, unless the plans are full and complete and the specifications explicit, these men cannot intelligently estimate on the work; consequently they will either refuse to figure the cost or will estimate so high as to be out of the contest. If, on the other hand, the plans and specifications are so well prepared that nothing is left to conjecture which can be shown, described or explained, the architect and owner will have the benefit of responsible competition and will secure a better installation.

A Field for Specialists.

A singular and unfortunate situation is to be observed in connection with the growing popularity of concrete residences. For some years past certain interests have exploited the advantages of concrete in this field of construction, with so much success that a rapidly increasing number of home builders are being impressed—and impressed so favorably that they are asking their architects for concrete houses. Some prospective builders have seen the very attractive concrete homes of their neighbors. The practical advantages of this kind of a home seem persuasive, and the architect produces some most charming designs. The site is selected, estimates are prepared, and—no one can be found to take the contract for the work.

The necessity for more attention on the part of the contractor to the application of concrete in residence construction is emphasized daily. Inquiries from home builders requesting information and assistance are received constantly. Cement exterior veneers are commonly resorted to when the difficulty of securing a contractor for a solid concrete structure is encountered. The situation pleases the plaster contractor and he welcomes the opportunity.

There is room for much progress and development in the direction suggested, and the field certainly presents a splendid business opportunity for specialists rather than the few general contracting firms now operating in it as occasion demands and conditions seem favorable. Cement houses may yet become a predominating architectural type, but the practical problems involved in building them will require a great deal of serious and intelligent study by the engineer and contractor.—Realty Record and Builder.

Reinforced Brickwork.

Joseph A. Hoffman of Mill Valley has patented a new form or shape of brick, to be reinforced after the manner of reinforced concrete, with iron straps, rods or bands of wire. These bricks or blocks have grooves or perforations or both. The perforations go through the narrow way of the brick and extend half through the width. The grooves go lengthwise or crosswise, so that the reinforcement may rest therein. They permit reinforcement vertical and horizontal. The intention is to attach the various sections of reinforcement to one another by means of welding eyes or perforations, and the top is to be anchored or riveted through a plate of steel or iron. Mr. Hoffman claims that all of the advantages of reinforced concrete construction are gained by this method, without the labor and expense of wooden forms, and that the greater strength of the reinforced brick construction will permit of brick walls being at least one brick thinner than under the present method of building, thereby saving expense.

High Pressure System for Oakland.

On July 12th was commenced the laying of the mains for the salt water high pressure fire system in Oakland. The pumps are now bein~ installed by the Doak Gas Engine Co., of Oakland. This new system of fire protection will affect a material reduction in the insurance rate in the business district, and will be quite a factor in attracting new manufacturing industries to the city.

Gilroy Bank Building.

Work has been started on a fine new bank building for the Gilroy Bank, from plans by Architect Marquis of Cooper street, Santa Cruz. The building is one and one-half stories and the walls are now being put up. The structure will be faced with Colusa sandstone, and will cost $30,000.

By the Way

Some Industrial Information Worth the While

A Paint for Concrete Surfaces.

Architects in search of a reliable paint for concrete surfaces—a paint that will not only act as a protection against dampness, but will serve to beautify the exterior of a concrete building, should investigate Concreta. The W. P. Fuller Company say that Concreta is a paint prepared expressly for coating cement, plaster and brick walls. Its wearing properties are unexcelled. Here is what its distributors say of it:

"It is much superior to ordinary oil paints for this special class of work.

"Concreta works freely and covers more surface than any other cement coating. Its economy, durability and sanitary properties make it an unequaled coating for use in mills and factories of concrete or brick construction. If an absolutely pure white coating, or an extra solid coating of the light shades is desired, two coats of Concreta should be applied. Allow at least forty-eight hours between coats. For interior work, two coats are required.

"Concreta has no equal as an undercoating for either enamel or oil paints that are to be used on exterior or interior surfaces of cement, concrete, brick or plaster. When properly applied to cement floors in hospitals and public buildings Concreta effectually stops the powdering of the cement. It is an invaluable sanitary coating for such surfaces. Concreta is not affected by sulphurous fumes, gases, etc."

A postal card addressed to the San Francisco office will bring further information and price list. When writing mention this magazine.

Reno Court House Competition.

The County Commissioners of Reno, Nev., have authorized a competition for a $120,000 court house. A premium of $3,600 is offered for the best plans accepted. Second and third prizes of $400 and $200 are also offered. The designs must be submitted not later than September 1.



BENEDICT BUILDING, SAN FRANCISCO
Righetti & Headman, Architects — Caldwell Company, Contractors

Promotion for Mr. Cutting.

There is considerable local interest in the announcement of the promotion of Mr. Frederick C. Cutting, manager of the Rochester office of the Lamson Consolidated Store Service Company, to head of the New York city department, with headquarters in the Brunswick building. Mr. Cutting is well known in San Francisco and is a brother of C. T. Cutting, the Pacific Coast manager of the Lamson Company. In announcing the promotion the company pays Mr. Cutting this splendid tribute:

"Mr. Cutting stands second to none in his knowledge of store service, and we are confident you will be more than pleased with the manner in which the gentleman will treat with you on all subjects pertaining to cash, package, pneumatic and special types of store service apparatus."

Superior Venetian Blinds.

By reason of an increased and constantly increasing demand for an improved Venetian blind, P. Ericsson & Co., of Gothenborg, Sweden, with sixty years' experience in this line of manufacturing, are now placing their product on the market in this country through the Swedish Venetian Blind Company, 1123 Broadway, New York; Williams & Carter, San Francisco, Coast distributors. These blinds are of exceptionally fine quality, possessed of many features—new to this country, and great general utility. These blinds are in marked contrast to the ordinary Venetian blinds on the market. They have only one combined pulley-head and turning lath, resting in iron hooks, not exposed to the slightest wear. The pulling up and regulating of the laths can more conveniently be conducted, as the pulling-cords may be drawn in any direction. The blinds stay automatically at any height when the pulling ceases. The thin laths are of the same length as the pulley-head and consequently cover the window entirely. Cords run in glass hoops and the wearing of the cord is thereby reduced to a minimum.

Palatial Apartment Hotel.

Architect Charles C. Frye, Metropolis Bank building, San Francisco, is preparing plans for one of the finest apartment hotels in the world, and which is to be erected in San Francisco as soon as the drawings are completed. The building will be an eight-story, Class A structure, with a frontage of 127½ feet in Van Ness avenue and of 204 feet in Sacramento street.

The site was purchased by the Avenue Hotel Company at a cost of $155,000. There will be 350 rooms in the hotel. It is proposed to make the appointments the most elaborate to be found anywhere. The immense space of the first floor will be given over to ballrooms, billiard parlors, lounging rooms and various departments for the convenience of the guests. The company will retain the management of the hotel, which is expected to be completed in one year at a cost of $750,000.

Keep the Flies Out.

The Hipolito Door and Window Screen Company of Los Angeles is shipping screens to all parts of the United States, and its factory is being run overtime to keep up with the orders. The Hipolito even tension screen, being made to order, is adapted to its general environment in appearance, and to its own particular opening in the matter of a neat fit. By its peculiar characteristics, it is distinctly adapted for use in all sorts of buildings, public and private; hotels, hospitals, office buildings, club rooms, apartment houses, homes—in short, wherever annoying insects are to be kept out by a neat and durable barrier.

These screens harmonize with their surroundings in construction, fitness, finish and wear. They are free from the defects of rust, sagging frames, illfitting corners; baggy, patched and ragged netting. The screens they make are a pleasure to the eye.

The cost to the customer is small, compared to value received. The reasons are obvious. Prices and catalogue may be obtained on application.



Structural Materials in Oregon and Washington.

The rapid growth of cities in Oregon and Washington has caused a great demand in these states for structural materials of all kinds, and although some of these materials are locally abundant and satisfactory, others have to be brought from great distances. Common bricks, which form the principal components of most buildings, are made in the vicinity of all the cities, even within the city limits, and the supply of loam suitable for making these is very great. Gravel and sand for concrete and sand for mortar are obtained in large quantities in the immediate vicinity of the cities. Cement, however, which is so extensively used in concrete, is produced at only one place in the two states, and most of that used is brought from distant points, much of it being imported from England, Germany, Belgium and Japan. Building stones are hauled many miles, especially the kinds used for interior decorations, most of which are shipped across the continent. High-class brick, terra cotta, lime, plaster, and many other building materials used in this region are produced at distant places.

Yet the cost of most supplies that are now brought from distant places can be reduced by utilizing the local resources of Washington and Oregon. Limestone is available in ample supply for cement manufacture; building stones, even to the finest marbles, exist in some of the mountains; and extensive deposits of clay, sands, and other building materials occur at many localities near the coast.

An investigation intended mainly to ascertain the local resources of the gravel, sand and crushed rock used in concrete in Portland, Seattle and Tacoma has recently been made by N. H. Darton of the United States Geological Survey and a report on the work published by the Survey as Bulletin 387, is available for free distribution. Representative samples of the structural materials were obtained to be tested in the St. Louis laboratories of the Survey, and considerable attention was given to the occurrence of limestone suitable for the manufacture of cement, many localities being visited in that connection.

The demand for building materials in the Northwest is well indicated by the fact that in 1906 building operations in Seattle involved an expenditure of $11,920,438 for labor and materials, and in 1907 an expenditure of $13,577,700. In Portland the amount in 1906 was $6,927,971, and in 1907 it increased to $9,446,982.

Mr. Darton's report gives also references to other sources of information in regard to building materials available in the region treated. Applications for the report should be addressed to the Director of the Survey at Washington, D. C.

Arthur Priddle's Success.

Arthur Priddle, patentee of the inner bond steel bar system for reinforcing concrete, has moved to larger and more centrally located quarters in the Whitney building, 133 Geary street. Mr. Priddle is having a good demand for his bar, which has been pronounced one of the best and safest reinforcing methods on the market. The Complete Construction Company, of which Mr. Priddle is manager and Clifford B. Rushmer is engineer, has recently taken the contract for the erection of a three-story building for Jas. D. Phelan at San Jose. This building will replace the one burned three years ago and will occupy one of the most prominent corners in the business part of the Garden City.



Thirty-Five Years Selling Hardwood.

On June 30th White Bros., the well-known San Francisco hardwood lumber dealers rounded out their thirty-fifth year in the business. In celebration of the event the firm published a new stock list, dated July 20th, and which shows a remarkable record, including, as it does, between two and three million feet of dry hardwoods.

The assortment of woods shows a greater diversity than any stock of hardwood in the United States. We, on the Pacific Coast, are so far from the places where hardwood is grown that all kinds of lumber must be carried here, whereas at Eastern and Mississippi river points, near to the source of supply, dealers specialize their stocks, one concern, for instance, will carry only ash and oak, another cherry and another mahogany. The various kinds of woods shown on White Brothers' stock list come from all portions of the earth—Europe, Asia, Africa and Australia, as well as the United States furnishing their quota.

White Brothers are manufacturers as well as importers and exporters of hardwood lumber, as they control the Petaluma sawmill. They have now on hand at that point over 100,000 feet of dry Genezero, West Coast mahogany and African mahogany, all perfectly manufactured and ready for use.

A Flourishing Enterprise.

The California Mantel and Tile Company (Inc.) of Oakland, but two years old, has recently started out to broaden the sphere of its operations and bid for work of a more pretentious character. Mr. Walter B. Fawcett, the president of the company, is one of Alameda county's best-known young business men, being prominent in both the political and social life of the bay city.

Starting with a modest beginning, the firm, by adhering to the rule, that the satisfied customer is its best advertisement, has built up a business on a thoroughly sound foundation. Since the company's removal to its present location, 110 Telegraph avenue and 1359 Broadway, Oakland, its business has increased to such an extent that it has become one of the leading concerns in the mantel and tile business in Alameda county, and has secured a number of large contracts, not only in Alameda county, but in other sections of the state.

Rich Marble Work in Home Telephone Buildings.

The Joseph Musto Sons-Keenan Company have executed most of the beautiful marble work in the Home Telephone Company buildings, illustrated in this number of the Architect and Engineer. This firm is one of the pioneer marble houses in San Francisco, and since the fire has been an important factor in the rebuilding of the city. Its marble is to be found in many of the largest and handsomest buildings. The Musto Sons-Keenan Company carry a large stock of specially imported material, including fancy marbles, such as Pavonazzo, Numidian, Sienna, etc. The marble in the Central Telephone Exchange of the Home Company is plain white, and is used as a wainscot in the building, and also for the counter screens in the main office. The marble is notable for its richness and simplicity. The carving was all executed by the company's own skilled workmen.

A Fountain Pen for Draftsmen.

R. C. Ferguson of 424 South Broadway, Los Angeles, has gotten out a splendid fountain drafting pen, which is unquestionably one of the most satisfactory fountain pens on the market. It is made of aluminum with finely tempered steel blades, handsomely polished. By slipping back the sleeve or ring, the points spring apart so that they can be readily cleaned. The pen is guaranteed not to clog. It is filled directly out of the bottle and when put in operation will feed automatically until empty. The draftsman with this pen can double his work, and for beginners it is invaluable.

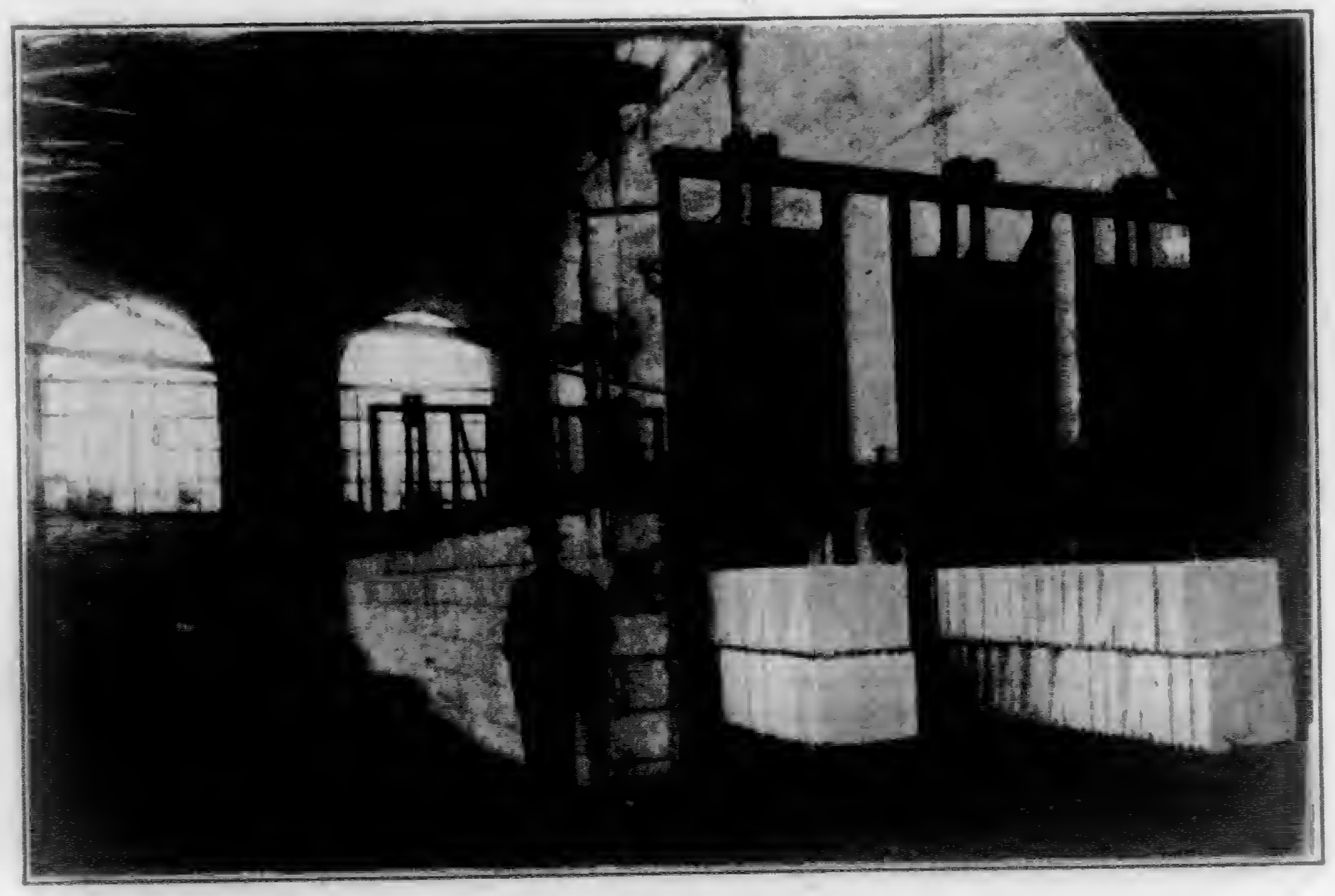


Blocks Ready for Shipment

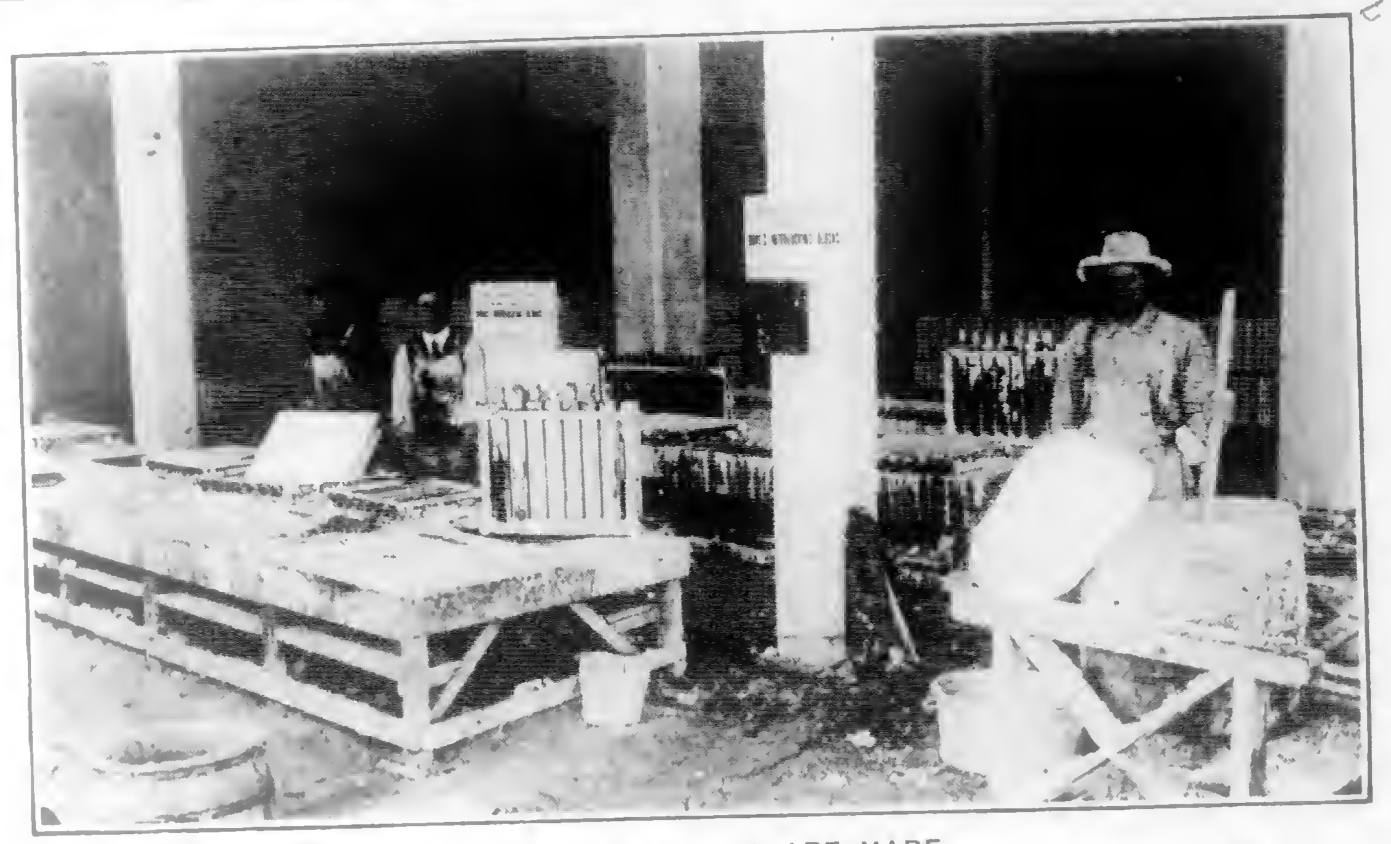
PLANT OF DODDS' INTERLOCKING BLOCK COMPANY

ON THE opposite page and above are shown the manufacturing and drying plant, also the process of manufacture and erection of Dodds' Interlocking Blocks, made in San Francisco.

The partition blocks are made in perfectly finished iron molds, true and square, and therefore produce a true and uniform cast. The blocks are absolutely kiln dried, making a hard dry finish, as well as being lighter in weight than any other form of partition on the market today. They are especially suitable for the subdivision of offices, as they can be erected and finished the same day, making immediate occupancy allowable. This is an advantage not obtained in any



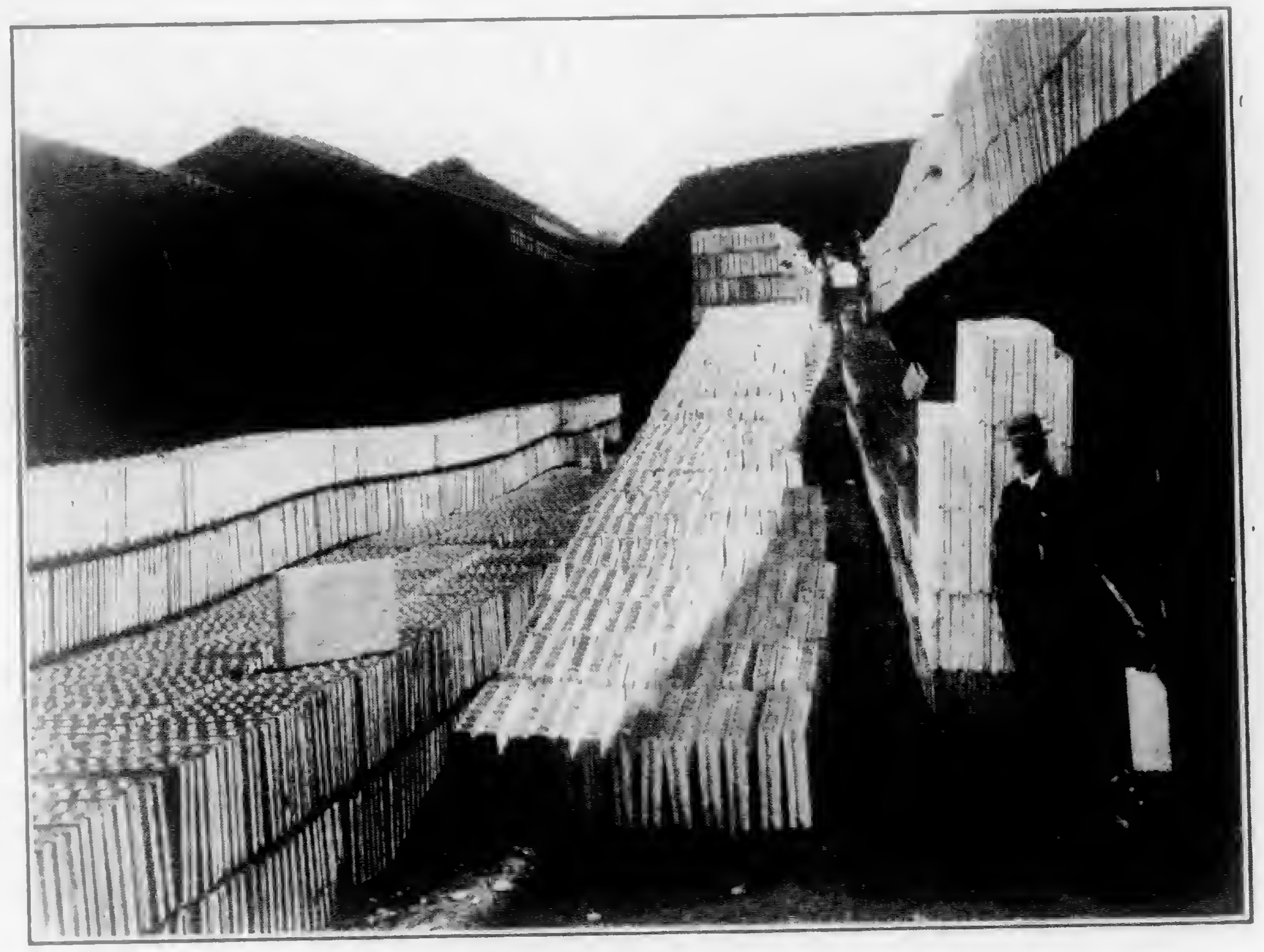
View of Interior of the Plant



HOW THE BLOCKS ARE MADE



HOW THE BLOCKS ARE INSTALLED

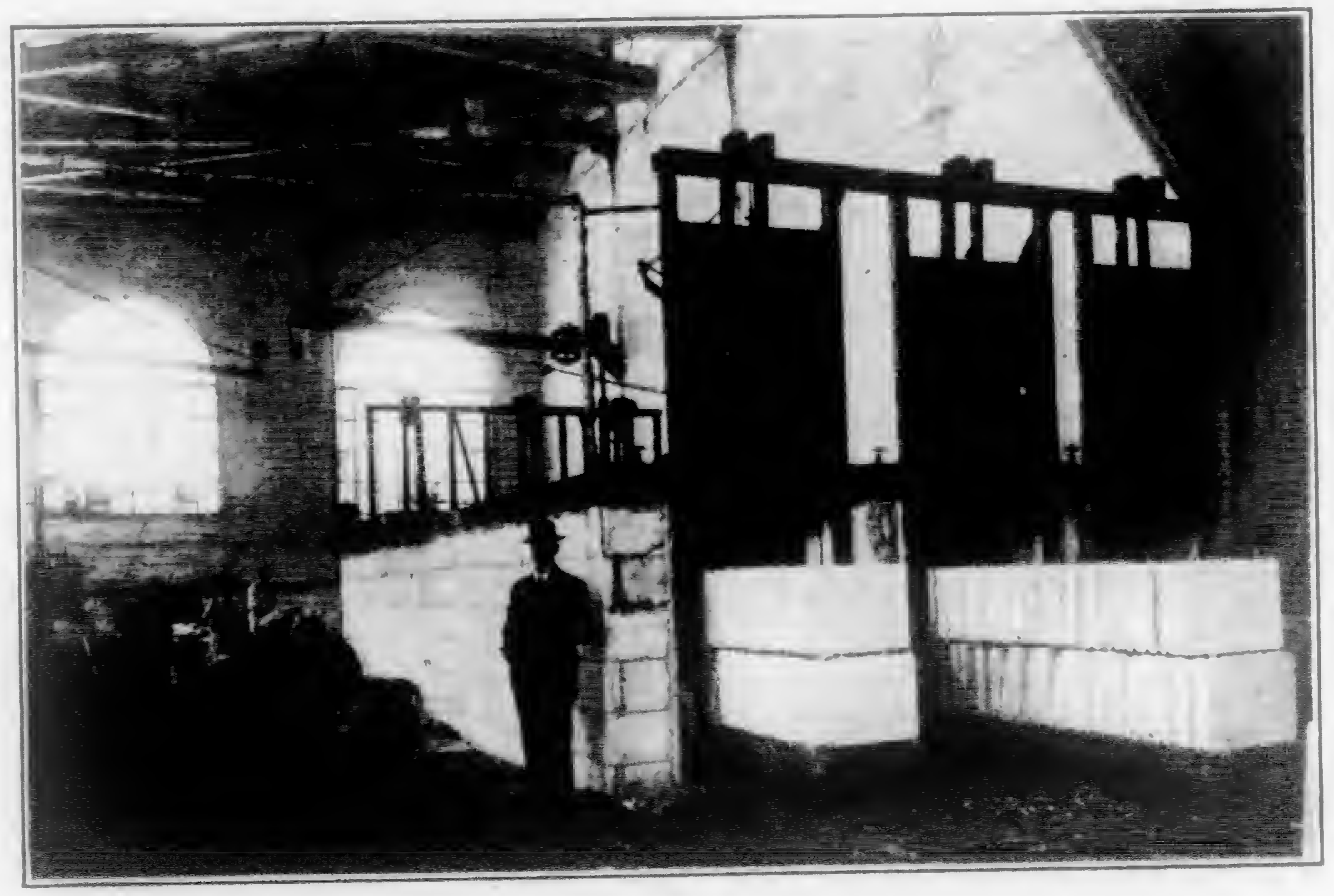


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View of Interior of the Plant

other form of partition. It is especially recommended for use in hospital and school construction, on account of the above advantages as well as its sound-proof qualities and sanitary finish.

With all partitions the company furnishes special interlocking door bucks and key blocks, which form an extra strong hold for door frames. Special furring blocks are also made.

The company carries a large stock of standard-size blocks (2½ in. and 4 in.), and are ready to install same on short notice.

Dodds' Interlocking Block Company also manufacture and install plastic decorations, fibrous ceiling slabs, imitation caen stone and artificial granite blocks.

The company would be pleased to bid on any of the above classes of work, and will compete with any form of partition on the market. A sample block will be furnished upon request.

In Larger Quarters.

A growing business has compelled the Silva Heating and Plumbing Company of San Francisco and Oakland to seek larger quarters in the former city. Manager Frank J. Silva has been fortunate in being able to close a satisfactory lease of the two-story building at 140 First street, and on the first of the month the firm moved from the Lick building to its new location.

The company has made good use of the basement, converting it into a repair shop, while the upper floor has been fitted up for the business offices and show rooms. The latter have been equipped with hot water heaters, boilers, basins, tubs, closets, etc. The company's specialty is plumbing and steam heat, and some idea of the magnitude of its contracts may be had from the statement that a force of twenty-five men is kept at work on the outside a greater part of the time, while the office help, including draftsmen, engineers and experts in heating and ventilating, numbers some eight or ten more. No job is figured under $2,000. One of the latest contracts taken by the company is for the plumbing and heating of the new Huntington apartment house at Thirteenth and Jackson streets, Oakland, Oliver & Foulkes, architects. There will be 245 fixtures in the building, and seventy baths.

Balfour, Guthrie & Co. Move.

Balfour, Guthrie & Co., importers of cement, structural steel, etc., have moved into their handsome new building on California street, adjoining the Alaska building. The structure is of reinforced concrete with an ornate front of classical design by Architect L. B. Dutton. This firm is one of the best known and most reliable building material houses on the Pacific Coast.

An Index to the Advertisements

[Index continued on Page 120.]

Big Profit in Waste Products.

The first organized undertaking to promote the general distillation of denatured alcohol, outside of what is called the "whisky trust," has been inaugurated in Cleveland.

"Denatured alcohol is now selling at 50 cents a gallon in barrel lots," said Carl Von Hartzfelt, metallurgical chemist of Wheeling, W. Va., who is the inventor of the first small still produced in this country for use by farmers and those who would make denatured alcohol in small quantities.

"Manufacturers of stills thus far have shown no ambition to make the small-size, being discouraged by the large distillers of denatured alcohol, and the tax of $20 on each still, no matter what its capacity, in an amendment tacked on to the original bill for free denatured alcohol, which was passed by Congress some two years ago.

"It was at first thought that the farmers would begin the distillation of denatured alcohol from their waste products," stated Hartzfelt, "but this tax of $20 a year on all stills, including the smallest, such as they would use, discouraged them, and to-day I know of no farmer who has attempted it.

"But even with the $20 tax there is money to be made with a small still out of the waste on a farm, out of sawdust and shavings, refuse from canning factories, and any vegetable matter that otherwise would be thrown away.

"A man could run a 100-gallon still on his home premises, even in the city, with sawdust or shavings (which make no odor) and make money. Every sawmill could increase its profits by having a denatured alcohol still attached. It is a sure source of profit to farmers, or even owners of truck farms about the city.

"Out of a twenty-acre truck farm the waste should support a 100-gallon still at a cost of 8 cents a gallon, with an output of 500 barrels a year.

"To-day the best fuel for automobiles is composed of half alcohol, half gasoline. Automobile works will gladly contract for an output of denatured alcohol. When it is cheap enough, it will be used in the motor boats. It can be made cheaper than artificial gas or gasoline, electricity, or coal, for cooking, besides being clean and odorless and requiring little labor in its use."

It Pays.

When the dimpled baby's hungry, what does the baby do?
It doesn't lie serenely and merely sweetly coo;
The hungry baby bellows with all its little might
Till some one gives it something to curb its appetite;
The infant with the bottle which stills its fretful cries
A lesson plainly teaches—it pays to advertise.

The lamb lost on the hillside when darkness closes round
Stands not in silence trembling and waiting to be found;
Its plaintive bleating echoes across the vales and meads
Until the shepherd hears it, and, hearing, kindly heeds,
And when its fears are ended, as on his breast it lies,
The lamb has made this patent: It pays to advertise.

The fair and gentle maiden who loves the bashful boy
Assumes in his presence a manner that is coy;
She blushes and she trembles till he perceives at last,
And clasps her closely to him and gladly holds her fast,
And as he bends to kiss her and she serenely sighs
This fact is demonstrated: It pays to advertise.

—S. E. Kiser.

ADVERTISERS' INDEX—Continued from Page 117



—Gravel Plant near Niles, Cal.

SCREENED GRAVEL FOR CONCRETE MIXTURE AND SURFACE WORK

The above cut shows the splendid gravel plant of the California Building Material Company, located at Niles, Cal. It is without doubt the best equipped plant of the kind on the Pacific Coast, being equipped with the very latest machinery the market affords. The plant has a capacity of 15 cars a day. Contractors in search of first class gravel for concrete mixture will do well to communicate with these people. Satisfactory prices and quick transportation are guaranteed. Besides gravel for concrete mixture the firm makes a specialty of a high grade roofing gravel and a handsome, as well as serviceable top gravel for sidewalks and roadways. The new Stockton road from Gault to Sacramento is being surfaced with Niles gravel. Other buildings where it is being used are the Western Pacific depots, the German Home at Fruitvale and the new Shattuck Hotel at Berkeley. The entire roof of the Phelan office building, San Francisco, is covered with Niles gravel. The office of the California Building Material Company is in the Pacific Building, San Francisco.

Boat Landing and Band Stand.

The Oakland Park Commission desires competitive plans for a boat landing and band stand for Lakeside Park, formerly Adams Point, which are to be erected at a cost of from $15,000 to $20,000. The band stand is to be of concrete.

Calls San Francisco a "Repair Town."

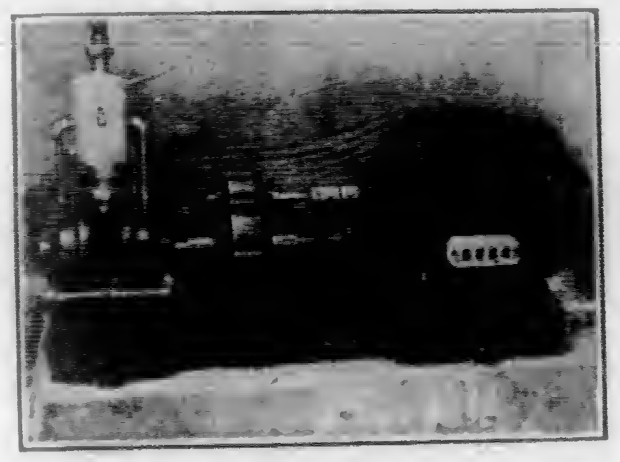
By H. W. Kerrigan, Commissioner.

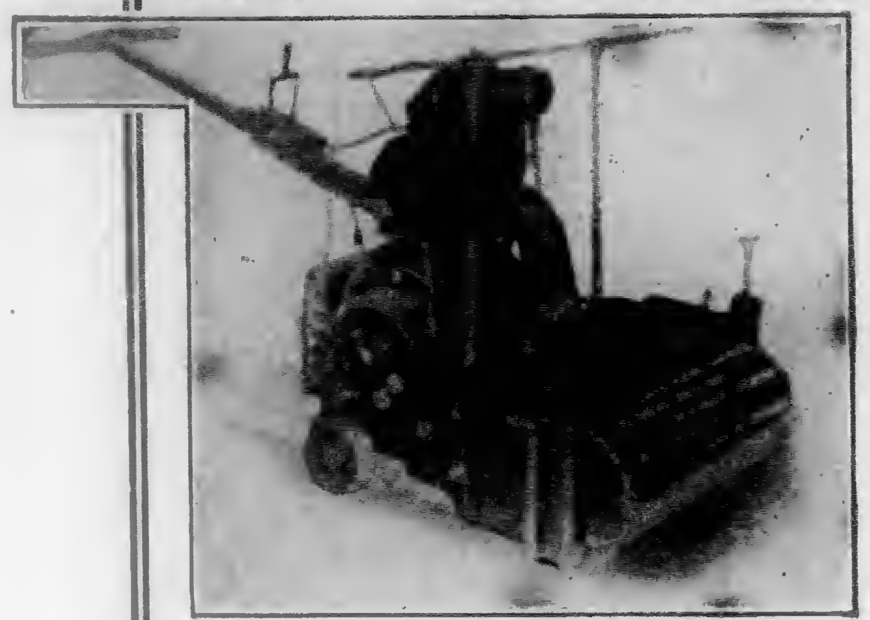
THE structural steel plants in San Francisco are still striving to hold at least 50 per cent of the steel business at home. But, after sacrificing every bit of profit above bread money for the last five months to hold the business, the business is again leaving the city in spite of their efforts.

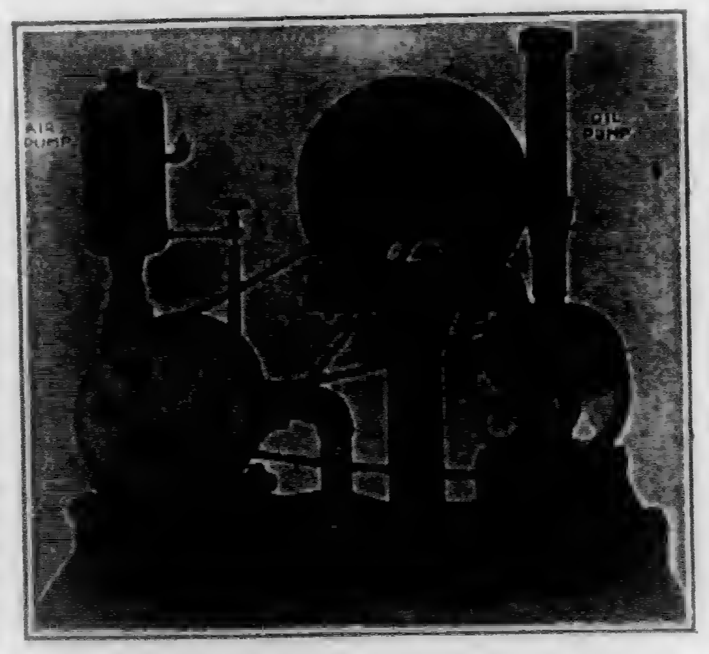
The only reason why the local plants have survived the loss of profit is because of the small jobs that are let on very short notice and must be finished in just as short a time. Those same contracts, in a majority of cases, would go East as well, if it were not that a few of the architects and contractors favor home industry.

And again it is because to send them East would take too long a time before the steel is erected and, therefore, the owners are forced to deal with the local steel shops. And as those are the only jobs let here, the steel men are cutting their own throats in the struggle of competition even to get what little they are doing. Again, in the larger jobs, a great many of the contractors and architects are still under the foolish impression that the local plants can't handle the big jobs, and when there is any difference whatever in the price in favor of the Eastern fabricator no preference is given to local industry. It is really a wonder that they survive. If they are going to make a









profit on the work they contract for, this profit must come from the railroads in their shipments on structural steel beams from points east of the Mississippi to Pacific Coast terminals. For, as it stands now, sending the finished or fabricated beams for the same price that they send the plain beams, there is not going to be any return for the local steel fabricator who has sacrificed his profits for six months or more, waiting patiently for the railroad to make a differential on the plain material in his favor.

For the last six months the Coast fabricators of steel have been buying foreign steel, forced to do so by the railroads. At the time of the last reduction on steel all of the local plants were ordering their steel from abroad, but on the reduction some of them resumed their buying in the East; but, again, foreign steel is $8 cheaper than the domestic, and if the railroads cannot see their way clear to give a differential, the local fabricators will continue to buy abroad, though preferring to buy at home.

But it is true in all other cases of the iron and steel industry in this city; there is no use for the local manufacturer—of machinery, boilers, castings, etc.—all he gets is a rush job and all the repairing work. In fact, all you can call this city is—not a manufacturing center, which it should be, on this Coast—but just a big repair shop. And why should it not be a manufacturing city? It was years ago, from 1880 up to 1898, and then less until the fire of 1906. We have the raw material and abundant water power, the plants, the equipment, the workmanship, with better mechanics; in fact, all the necessities of a manufacturing city.

One of the principal reasons for the loss of our business is that the city, geographically situated as it is on the Pacific Coast, is a natural magnet for every manufacturer's agent from the East who has secured a strong foothold here and intends to stay.

Modern Wood Finishing.

The Bridgeport Wood Finishing Company has just published a very handsome booklet, "Modern Wood Finishing," which every architect should have on file in his office for reference. The book is profusely and handsomely illustrated in vari-colored inks that bring out the swell grain effects just as the Wheeler filler and Bridgeport standard stains transform a piece of unsightly wood into a thing of beauty.

The following extract addressed particularly to architects, is worth quoting:

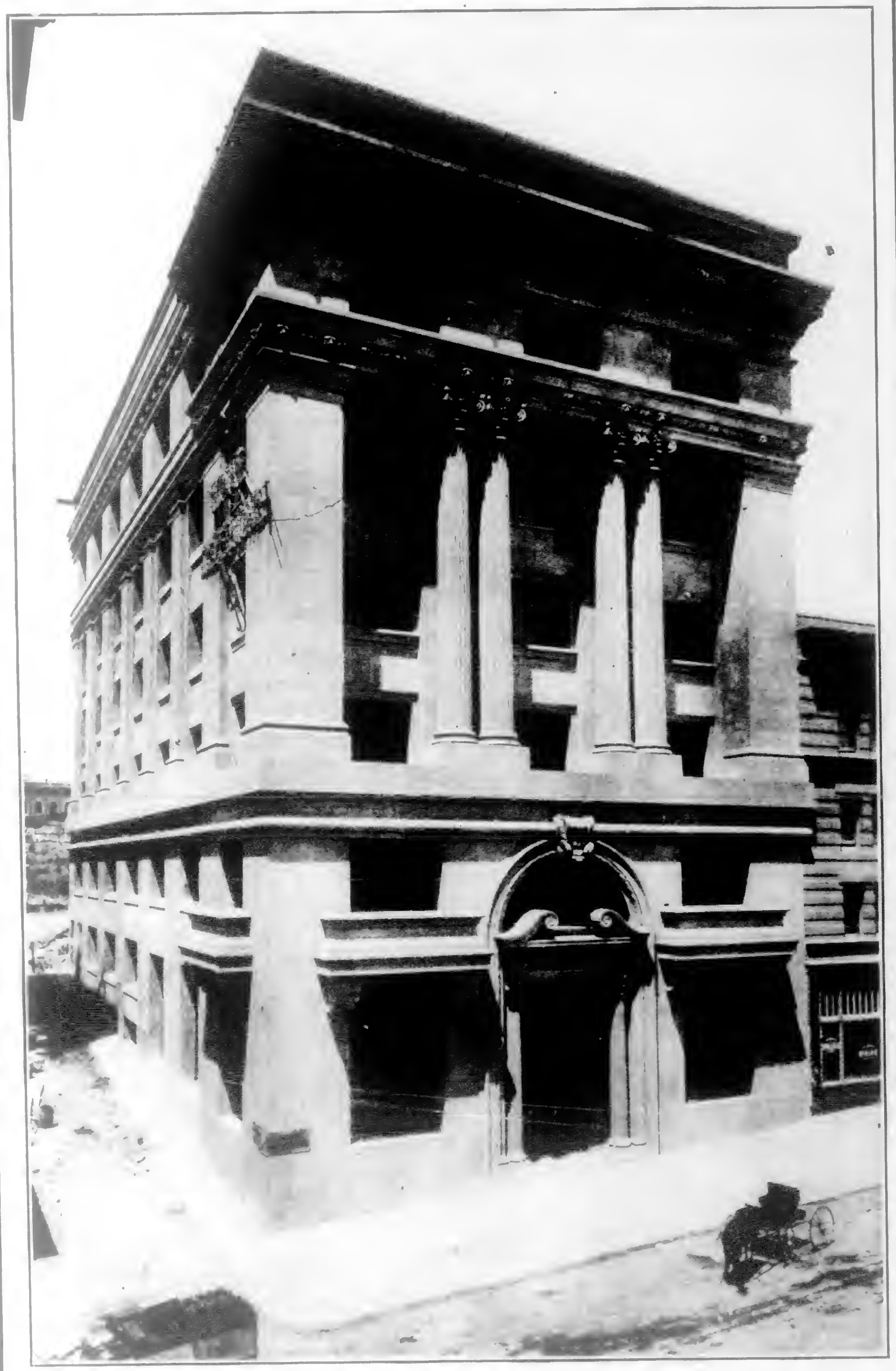
"Throughout the world Wheeler's wood filler has for many years been recognized as the standard, simply because it is known to produce the best, the most permanent and the most economical finish on wood.

"In view of these facts it will pay all architects not only to specify Wheeler's filler and Bridgeport standard (Breinig's) stains, as they have in the past, but to see that their specifications are carried out. If a little care in this respect is taken by architects, the results obtained will be satisfactory to all parties concerned."

The Whittier-Coburn Company are the Pacific Coast distributors for the Bridgeport goods.

Book Review

Gustav Stickley's new book, "Craftsman Homes," is one of the best things we have seen in that line in a long time and the volume is bound to be popular. "The Art of Building a Home," "A Craftsman's City Home," "A Country Club House," "Native Woods and Their Treatment," "Home Training in Cabinet Work," are some of the topics treated. The craftsman idea is, of course, fully exploited throughout the various chapters by the author. In this volume is set forth the principles that rule the planning of the craftsman house, with hints at the kind of life that would naturally result from such an environment. The 226 pages carry over two hundred illustrations. The Craftsman Publishing Company, 41 W. 34th Street, New York.



Home Telephone Building (Central Station), San Francisco. Coxhead & Coxhead, Architects.

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The Western Magnesite Development Company.

The California Peerless Stone, Tile and Plaster Company has incorporated as the Western Magnesite Development Company and has moved from the Foxcroft building, San Francisco, to spacious offices on the ninth floor of the Metropolis Bank Building in the same city. This company owns rare deposits of magnesite in Santa Clara and Stanislaus counties and on Red Mountains and with additional stock, which is now being subscribed, it is proposed to develop the holdings on an extensive scale. The officers of the company are Frank T. Shea, the architect, who is president; James J. Cummings, vice-president; Russell W. Cantrell, Secretary and Thos. H. Wolf, treasurer.

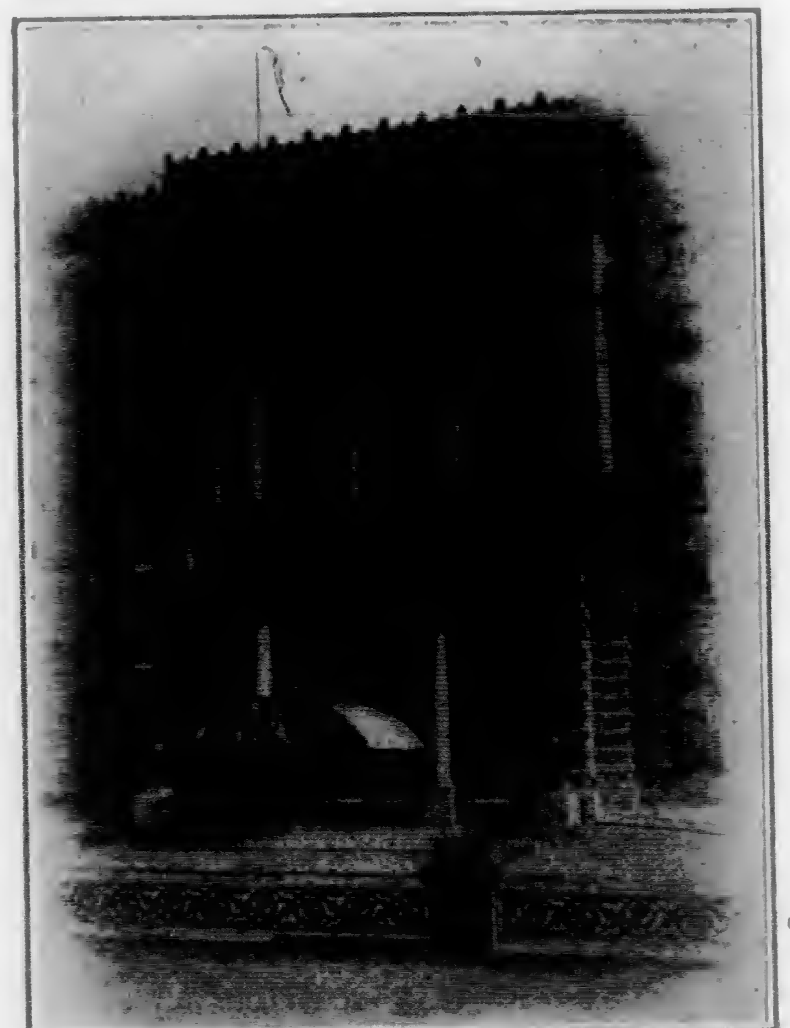
In an elaborate prospectus recently issued by the company, some remarkable statements appear, of which the following are extracts:

"The structures of the future (excepting the frame) will be constructed entirely of a single material, which will apply itself in varied forms to all character of construction, ornamentation and color, and at the same time possess to the utmost degree the valued qualities of resistance to heat and cold, be non-absorbent and hold the inherent qualities of lasting endurance.

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"Improbable, as the above may appear to the ordinary mind, The Western Magnesite Development Company is prepared at once to demonstrate the absolute truth of every statement.

"With the acquisition of the business and properties of the Peerless Company, together with its own resources, the Western Magnesite Development Company offers to the public one of the best and most solid investing propositions of the century. With the company controlling practically the entire output of pure magnesite in America, the title to its various mining claims, fully protected by the United States Government, with $350,000 already invested on the properties in development work, the building of good roads and the installation of almost complete mining machinery; but 60 miles from San Francisco and only 27 miles from the railroad, together with a fairly well equipped factory at









San Leandro, for the manufacture of various products; free and clear of debt; the opportunity for realizing large returns on the investment is one which occurs in the lifetime of only the most fortunate.

"This company has been capitalized at $1,500,000, divided into 1,500,000 shares at $1 par value. It is the present intention of this company to place on the market for immediate sale 300,000 shares of its capital stock."

Building Construction and Superintendence.

This work, by F. E. Kidder, C. E., bears evidence of the time, labor, thought and persistent effort that has been put forth to collate, arrange and properly classify all the data that belongs to the latest and modern accepted practices.

To quote from Prof. Nolan's preface, "The new edition includes in general a careful examination of every article in the book and a revision of every one in which changes, ommissions or additions of data or methods of procedure are deemed necessary or advisable; the ommission of some articles and the additions of many new ones, the recruiting of some chapters and the addition of one entirely new chapter. Published by Wm. T. Comstock, New York.

Competition for Design for A Boat House.

The competition to be open only to architectural students, whether in architects' offices or in colleges, in California, Oregon, Washington, Nevada and Utah.

No architect may compete.

The Architect and Engineer shall have the exclusive privilege of publishing any or all designs submitted.

Situation:

Boat house to be on the Twelfth street boulevard, Oakland, on the north side of the street, which is filled or "made land," and incloses an arm of the bay which is called Lake Merritt; the boat house is to face Peralta Park on the south, which park is now being graded. The building, of fireproof construction (reinforced concrete), to rest upon concrete piles. The exterior design and arrangement is to be left to the competitors, the committee only requiring that the building be of two stories, with gallery or balcony on upper story, and that provision be made for an office, men's and women's dressing rooms, repair shop, lockers, lunch room, spacious lounging room, large float with stairs leading from float to first story of boat house; provision should also be made for flag poles, or other arrangements for displaying flags; also for living rooms, on the upper story, for the family of the boat house keeper. The length of the building, east to west, must not exceed 450 feet. The cost of the building should not exceed $25,000.

Drawings:

To be made on a scale of one-eighth inch to one foot, on white Whatman paper, and to consist of:

Foundation plan,
First floor plan,
Second floor plan,
Section through building,
Four elevations, all in black ink, and no coloring.

Perspectives, while not required, will be used for reproduction if they possess merit.

The designs will be considered by a Board of Judges, to consist of Mayor Frank Mott of Oakland, California, Messrs. Walter G. Manuel, W. S. Gould and Jas. P. Edoff, who constitute the Board of Park Commissioners of Oakland, and some authorized representative of The Architect and Engineer.

Prizes:

Five prizes will be awarded as follows:

For the best design, a Bostrom level, value $25.

For the second best design, a set of K. & E. drawing instruments, value $15.



For the third best design, a set of scale rules, in case, value $10.

For the fourth best design, a set of triangles, value $7.50.

For the fifth best design, a Ferguson fountain drawing pen, value $5.

Requirements:

The design must be delivered personally or forwarded by mail, prepaid, addressed to "Competition Editor," The Architect and Engineer, 621 Monadnock Bldg., San Francisco, Cal., and must be received at this office not later than October 15, 1909.

Roofing Economy vs. Roofing Extravagance.

Nowhere does the old saying that "the best is the cheapest" hold more true than in the choice of roofing materials.

Every builder and architect feels and preaches that a cheap roofing is a "trading down" proposition—always worth less than it costs, despite its low price—that the use of such roofings, with their frequent paintings and repairs, and the possible damage to buildings and contents, is a positive extravagance.

In the Asbestos Century shingles is found a roofing whose use is the truest economy.

The economy begins with the first cost. Being one-half lighter than slates, a lighter roof frame is used—a considerable and actual saving in these days of high lumber prices. The shingles are all exactly sized, and some styles are already punched with nail holes, so that the alignment is not only more certain, but more quickly done—a saving in labor.

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No repairs have to be done. Asbestos Century shingles are improved by dampness, and by freezing and thawing, which hasten the maturity of the shingles. Hail cannot break them. They expand and contract so uniformly, and the asbestos fibers reinforce the concrete in every direction so thoroughly that the shingles do not crack. Tramping over them by linemen does no damage.

They protect the buildings absolutely from sparks on the roof (the cause of one-fifth of all the fires in the country), and confine a fire, accidentally started, within the building.

"They outlive the building without painting or repairs."

Architects and builders who are not in touch with the live issues in roofing should write to the Keasbey & Mattison Company, Ambler, Pa., for a handsome folder, showing asbestos Century shingles as applied to all classes of buildings in all parts of the country.

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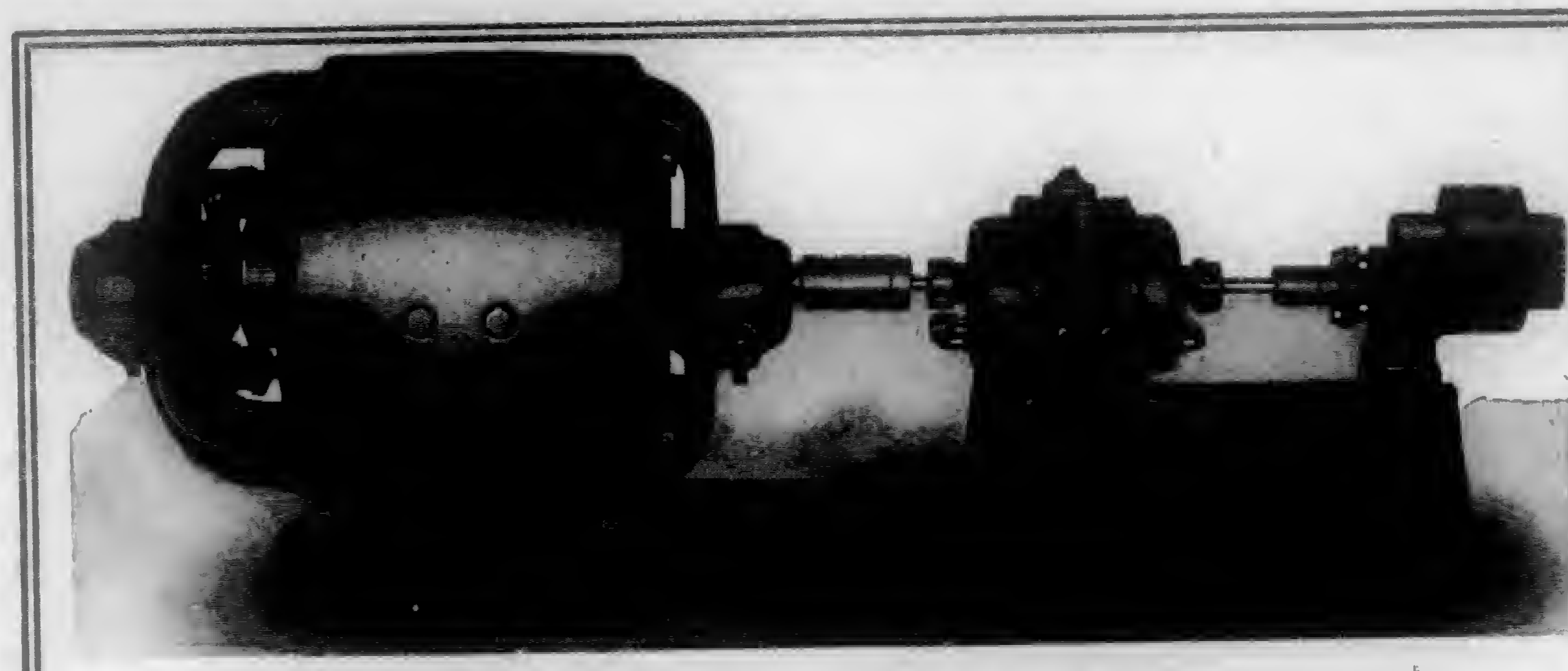
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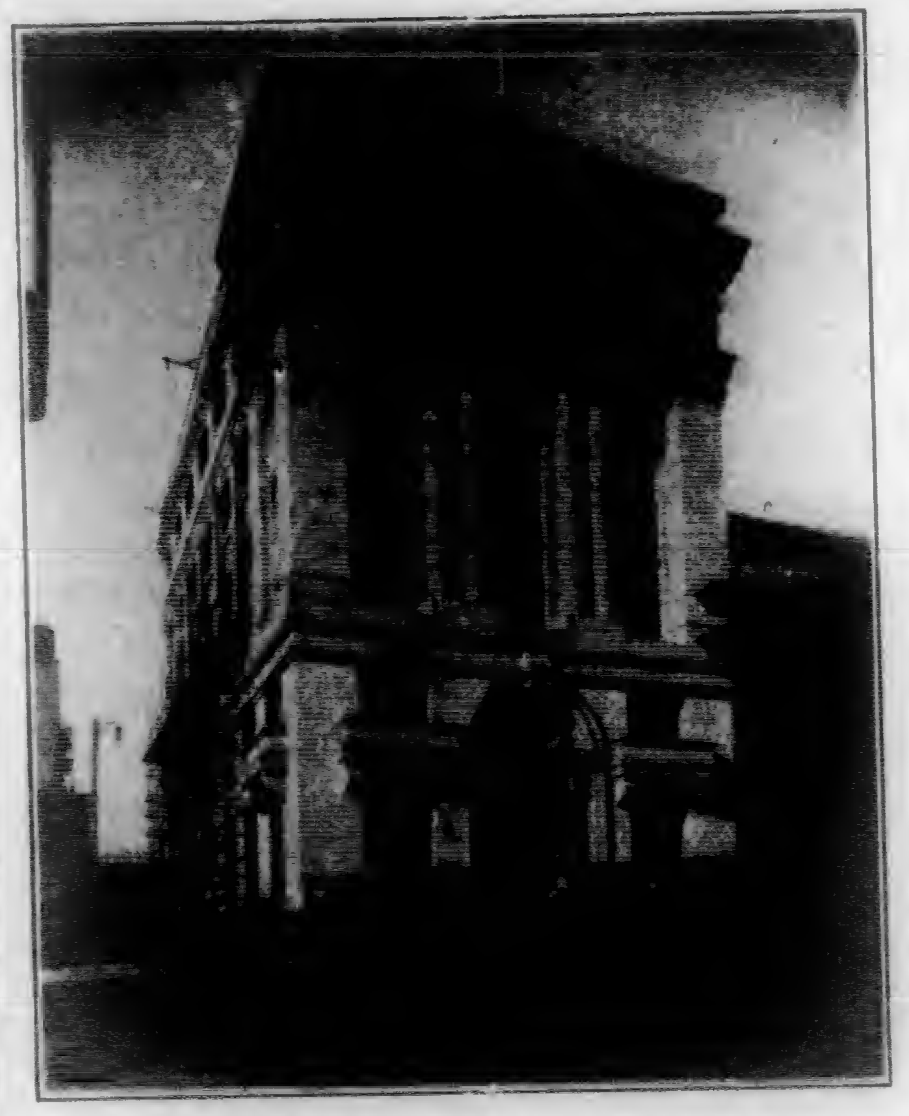
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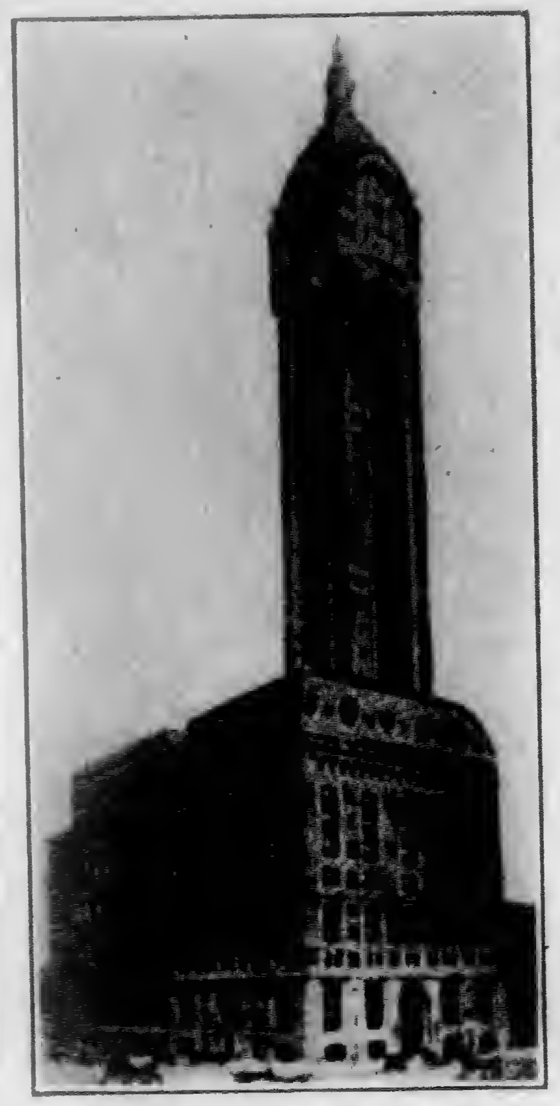
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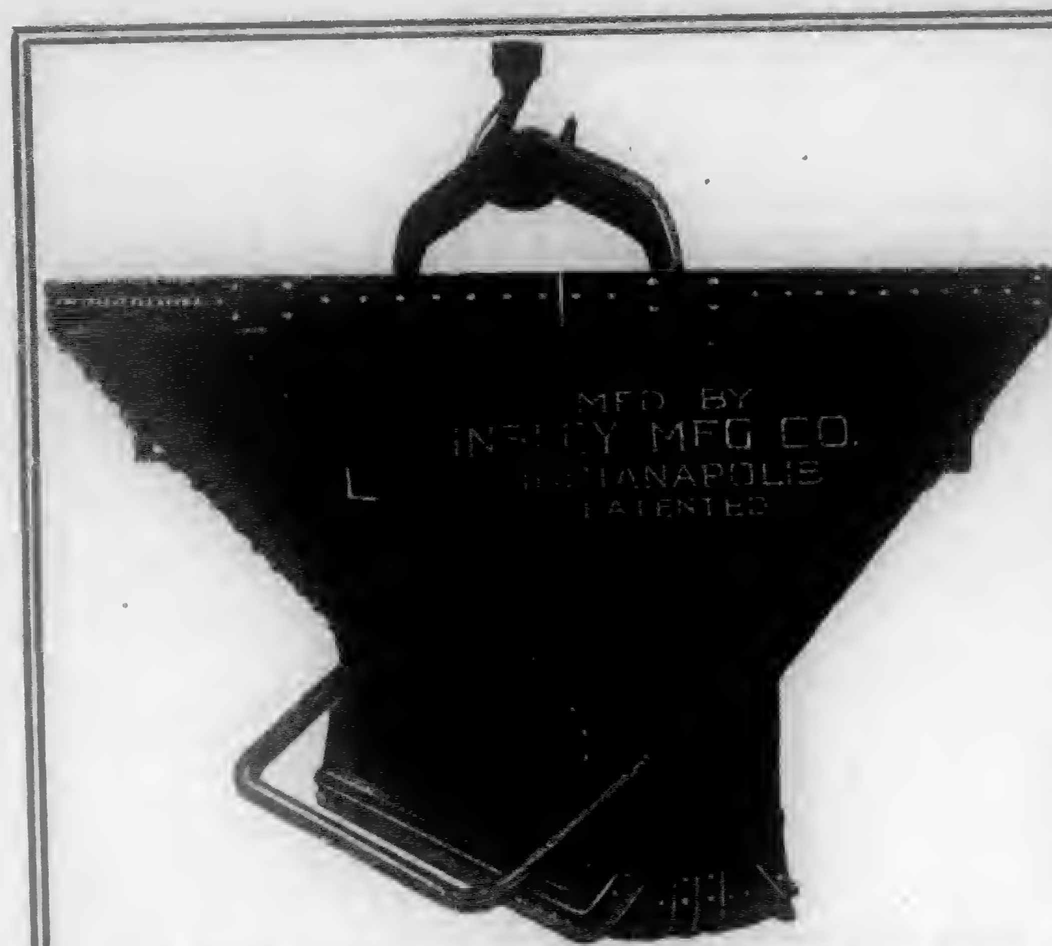
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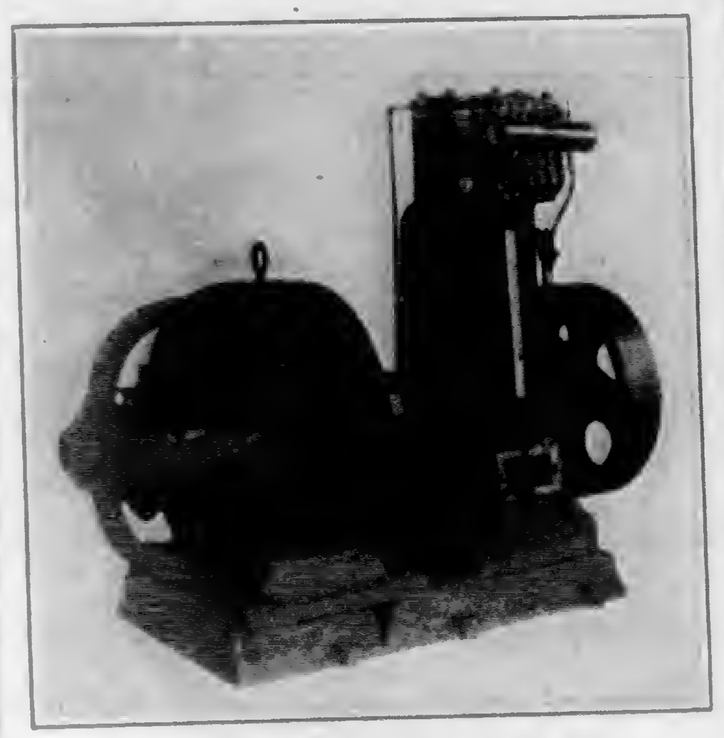
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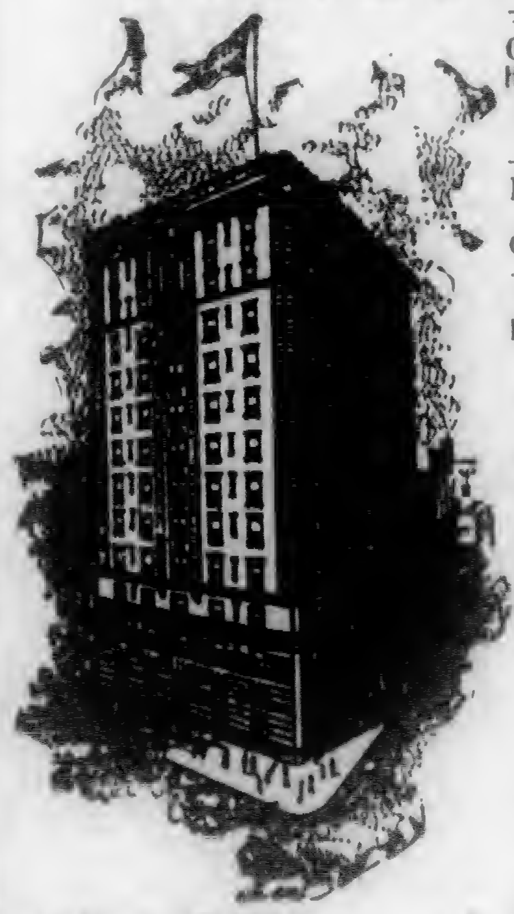
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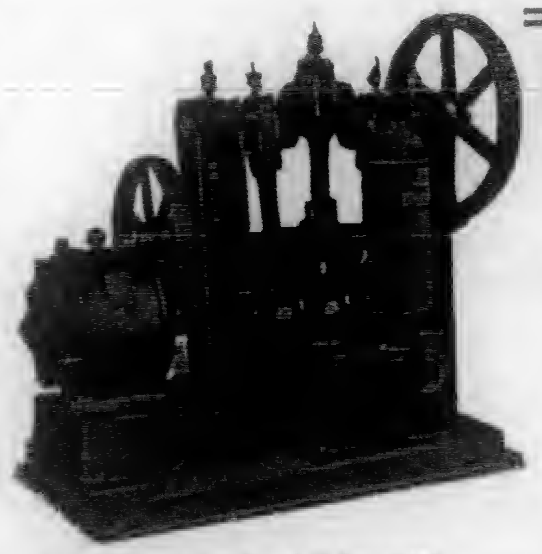
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E. T. Wheeler, C. E., Pacific building, Los Angeles, has plans for a steel bridge to be built over the Los Angeles river on Long Beach boulevard.

A reinforced concrete bridge, to cost about $10,000 is to be built over the Santa Cruz river at St. Mary's Avenue, Tucson, Ariz. The plans are by City Engineer Dietrich.



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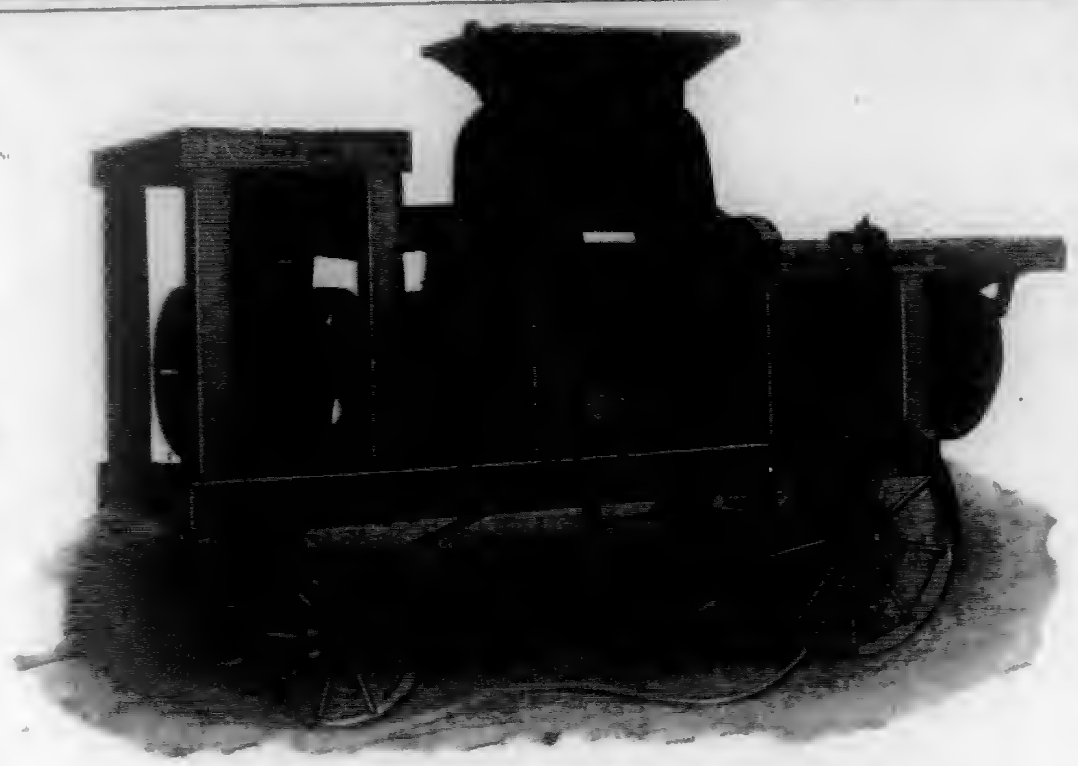
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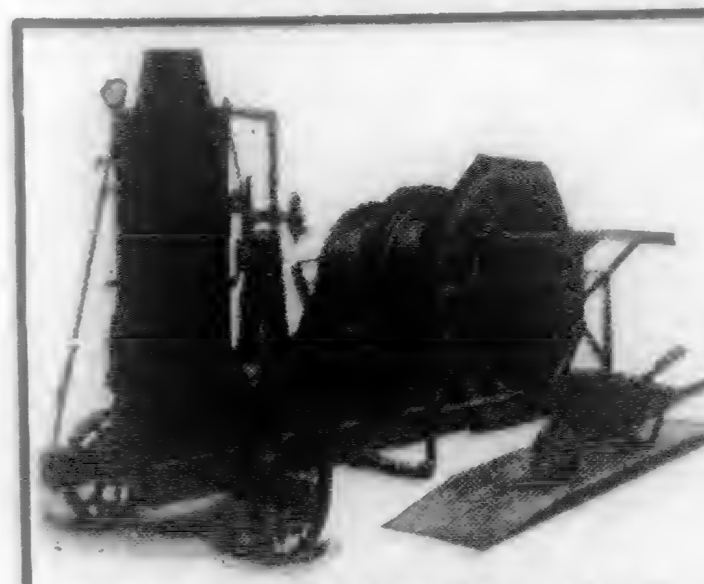
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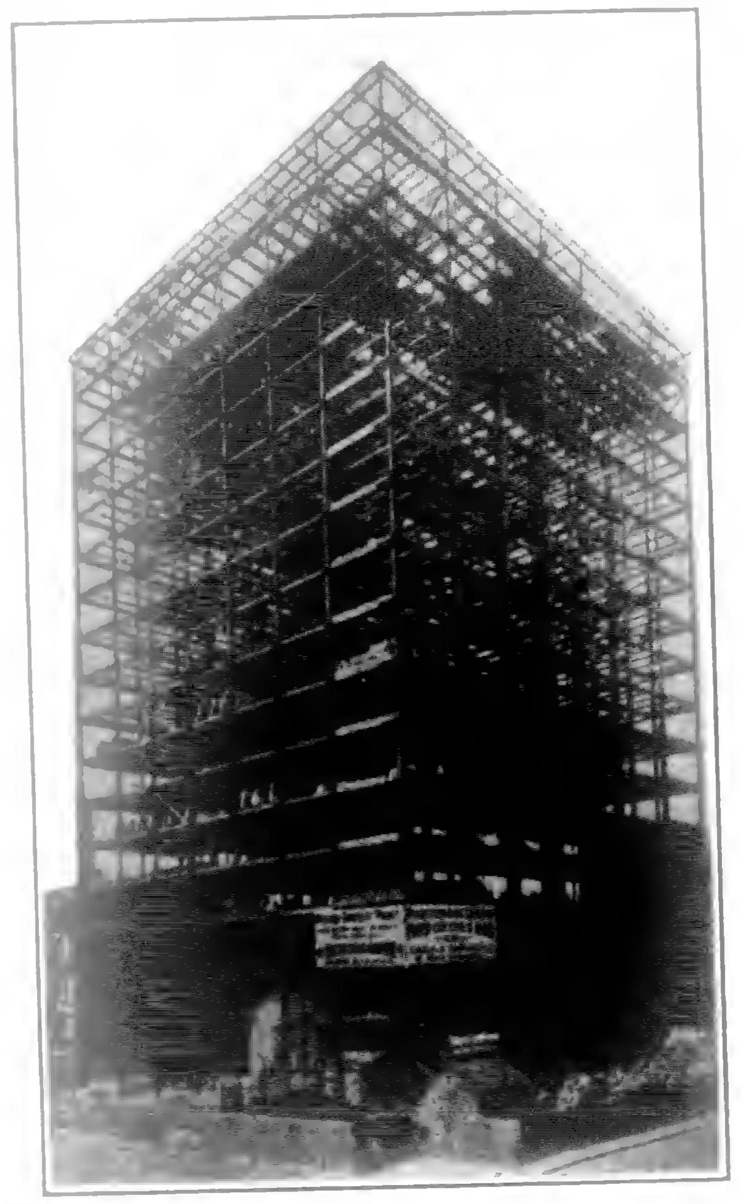
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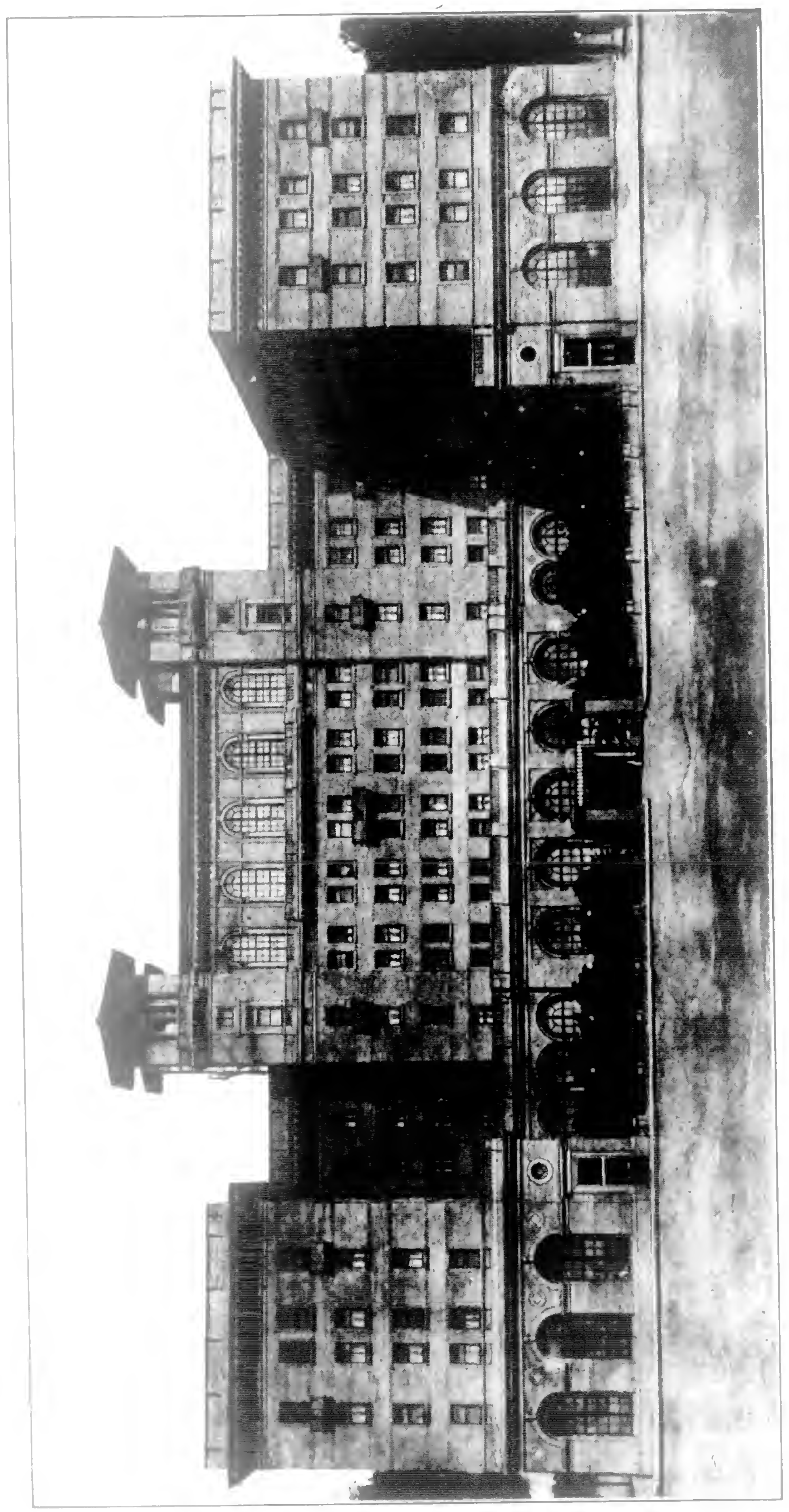
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Contents for September



DESIGN FOR THE BANKERS' HOTEL, OAKLAND, CAL.

Bliss and Faville, Architects

From a Photo of the Architects' Drawing by the Oakland [illegible]

THE

Architect and Engineer

Of California

Pacific Coast States

VOL. XVIII. SEPTEMBER, 1909. No. 2.



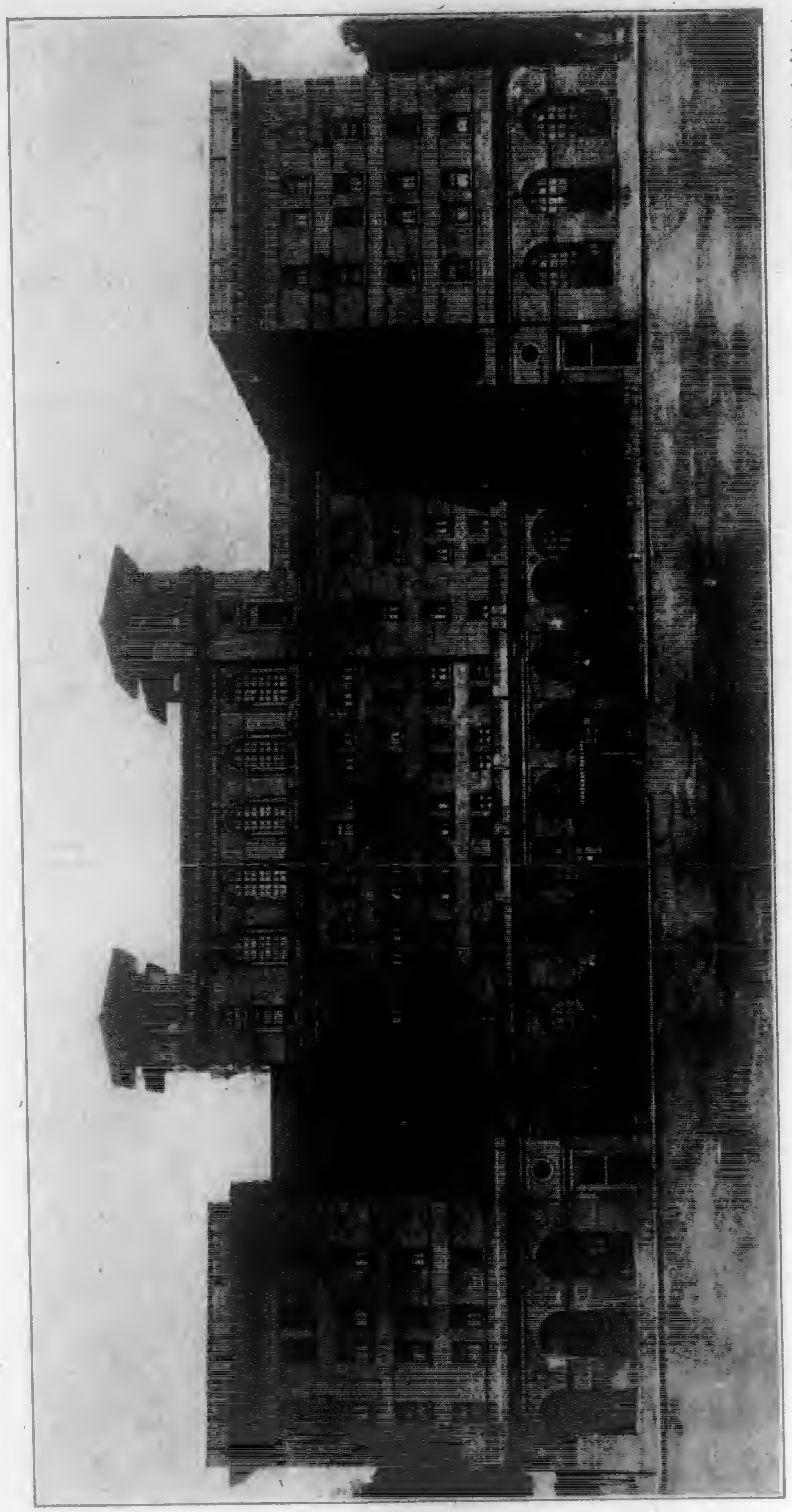
Entrance Idora Park, Oakland
W. L. Woollett, Architect

Making an Amusement Park Beautiful

CONSIDERABLE space is given in this issue to illustrating the various amusement buildings at Idora Park, Oakland, the architectural treatment of which is so unusual that it presents an interesting study. The buildings are for the most part temporary structures, built for a season or so, intended to mask fearful and wonderful things behind, to present a brave front and not to offend the aesthetic patrons of the park.

A scholarly treatment of such a problem as an amusement park affords is, from the nature of the case, well nigh impossible; however, such were the natural advantages of the site, particularly in reference to the groups of trees and shrubbery already in place, that the idea was formulated to make a really beautiful park, as well as a place of amusement. Accordingly, a general architectural scheme for development was adopted, and the buildings are constructed in harmony with this plan.

Having adopted the mission style, as on the whole best suited to these purposes, it remained to electrify this ecclesiastical motif with a sufficiency of the "festival spirit." In architecture, as in other forms of art, an occasional deviation into the realm of fancy is pardonable. Therefore, in the pure spirit of play, and without regard to convention, Chinese dragons in all their oriental magnificence appear in the pediment of the band stand; black swans perch in the pergolas, forming the cap motif; and color, the thing which California cries for in architecture, is used, "susiter sed fortiter," and in the manner, if you please, that the Mission fathers would have used it had they been under the necessity of building an amusement park (for this generation).



DESIGN FOR THE BANKERS' HOTEL, OAKLAND, CAL.

Bliss and Faville, Architects

From a Photo of the Architects' Drawing by the Oakland Tribune

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A scholarly treatment of such a problem as an amusement park affords is, from the nature of the case, well nigh impossible; however, such were the natural advantages of the site, particularly in reference to the groups of trees and shrubbery already in place, that the idea was formulated to make a really beautiful park, as well as a place of amusement. Accordingly, a general architectural scheme for development was adopted, and the buildings are constructed in harmony with this plan.

Having adopted the mission style, as on the whole best suited to these purposes, it remained to electrify this ecclesiastical motif with a sufficiency of the "festival spirit." In architecture, as in other forms of art, an occasional deviation into the realm of fancy is pardonable. Therefore, in the pure spirit of play, and without regard to convention, Chinese dragons in all their oriental magnificence appear in the pediment of the band stand; black swans perch in the pergolas, forming the cap motif; and color, the thing which California cries for in architecture, is used, "susiter sed fortiter," and in the manner, if you please, that the Mission fathers would have used it had they been under the necessity of building an amusement park (for this generation).



Exterior View of Wall Surrounding Idora Park
W. L. Woollett, Architect



Swan Pergola Connecting Concessions and Restaurant
W. L. Woollett, Architect



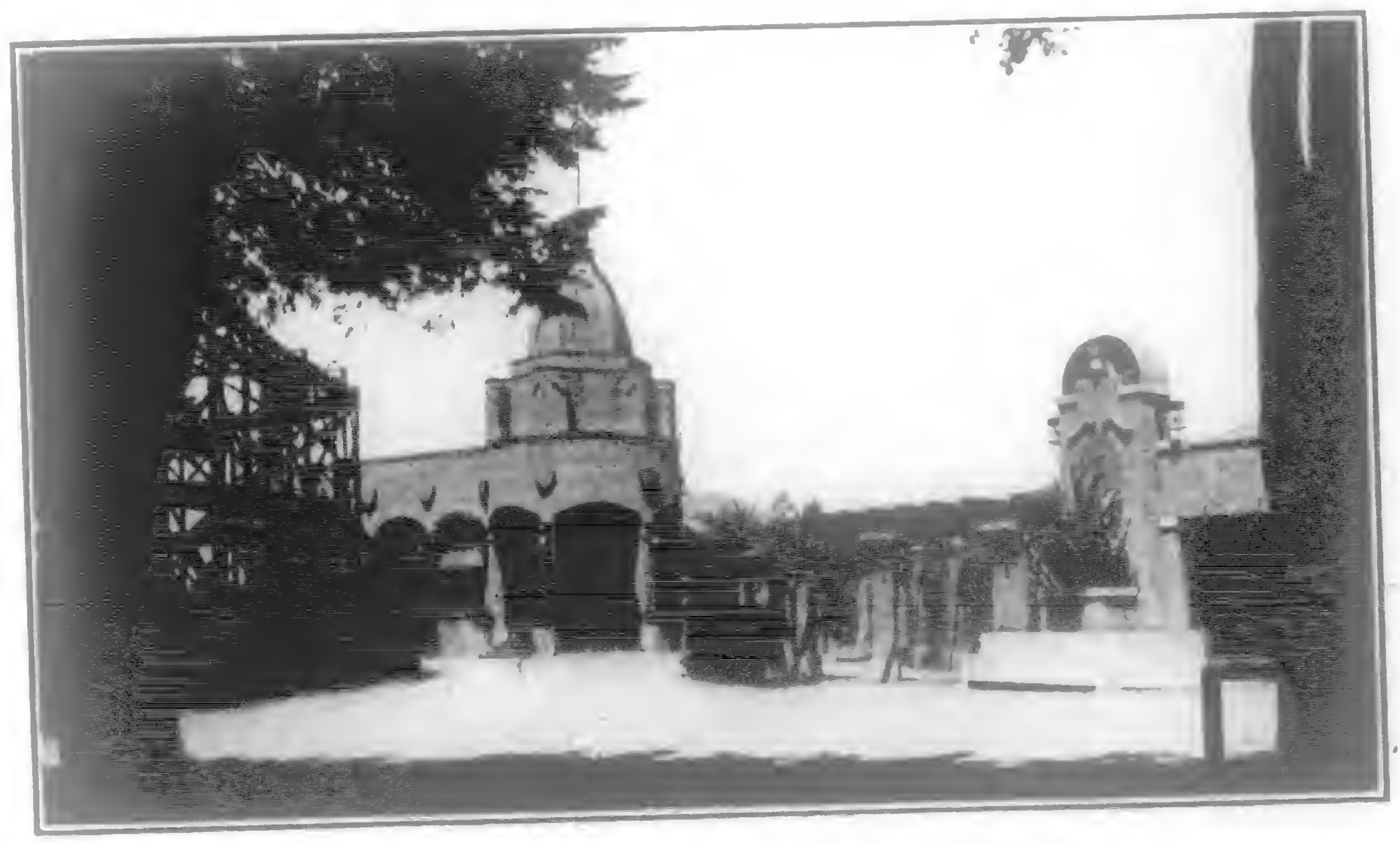
Bear Cage, Idora Park
W. L. Woollett, Architect



Interior View of Wall Surrounding Idora Park
W. L. Woollett, Architect



Exterior View of Wall Surrounding Idora Park
W. L. Woollett, Architect



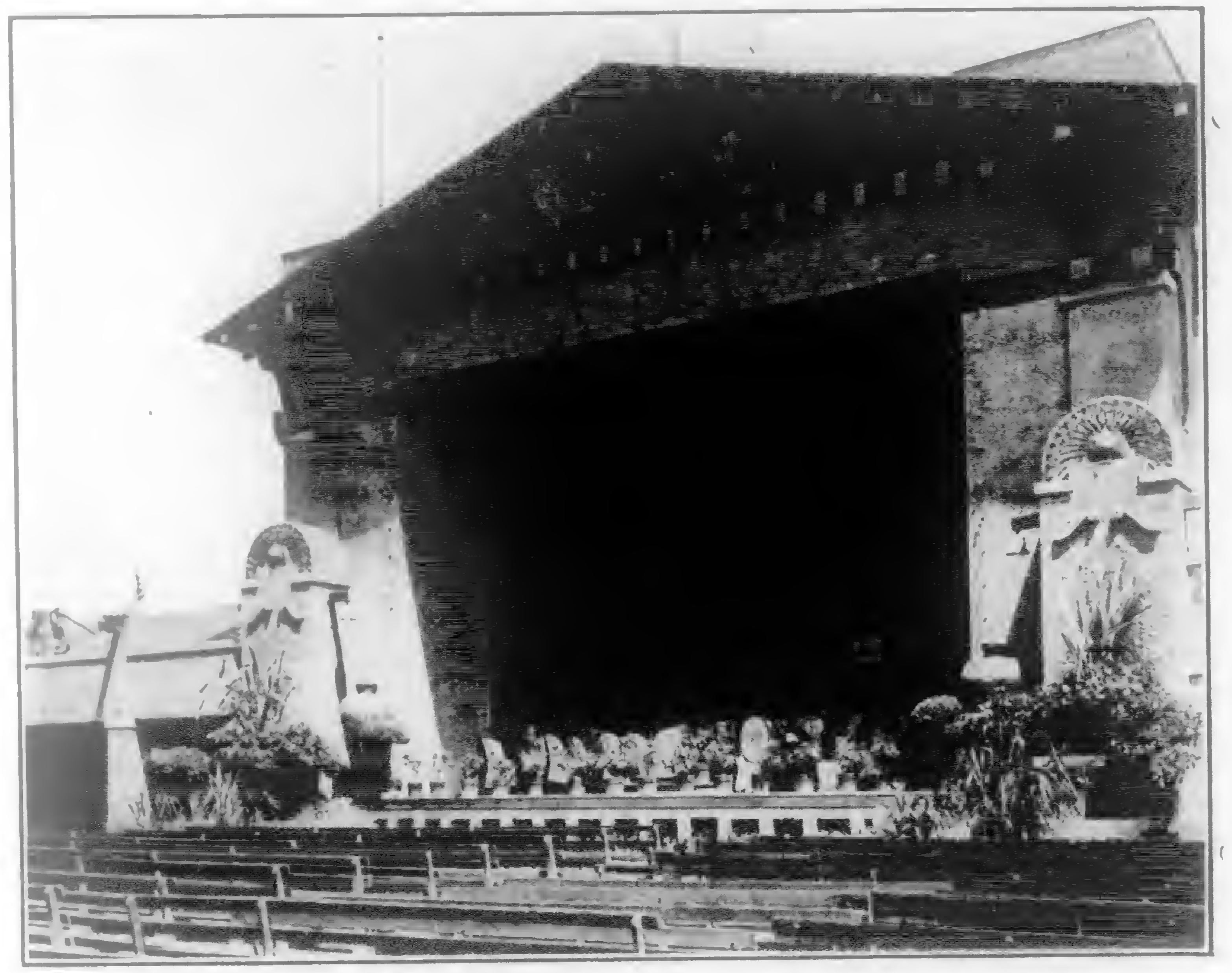
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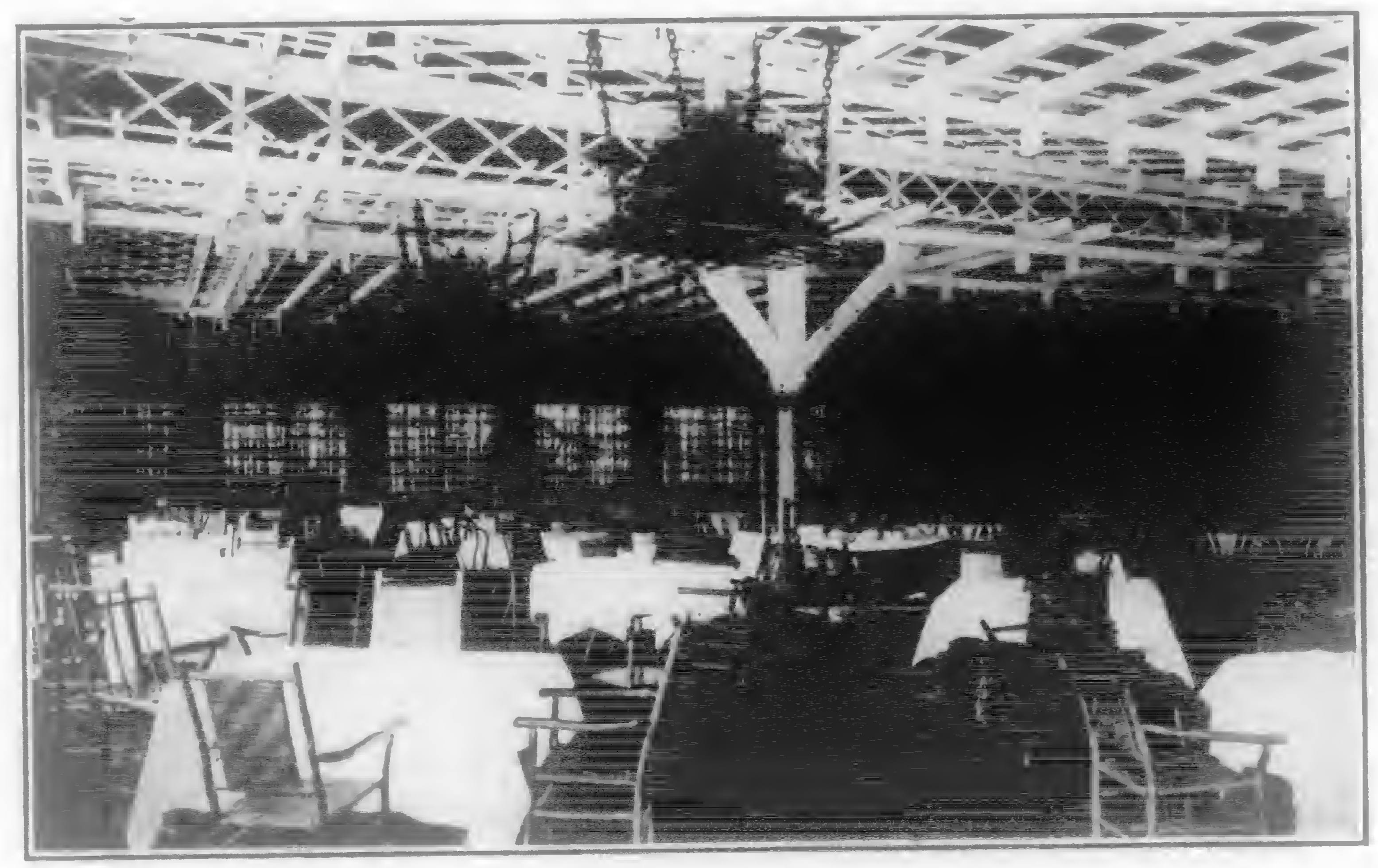
Shell for Bandstand, Idora Park
W. L. Woollett, Architect



Concession, Idora Park
W. L. Woollett, Architect



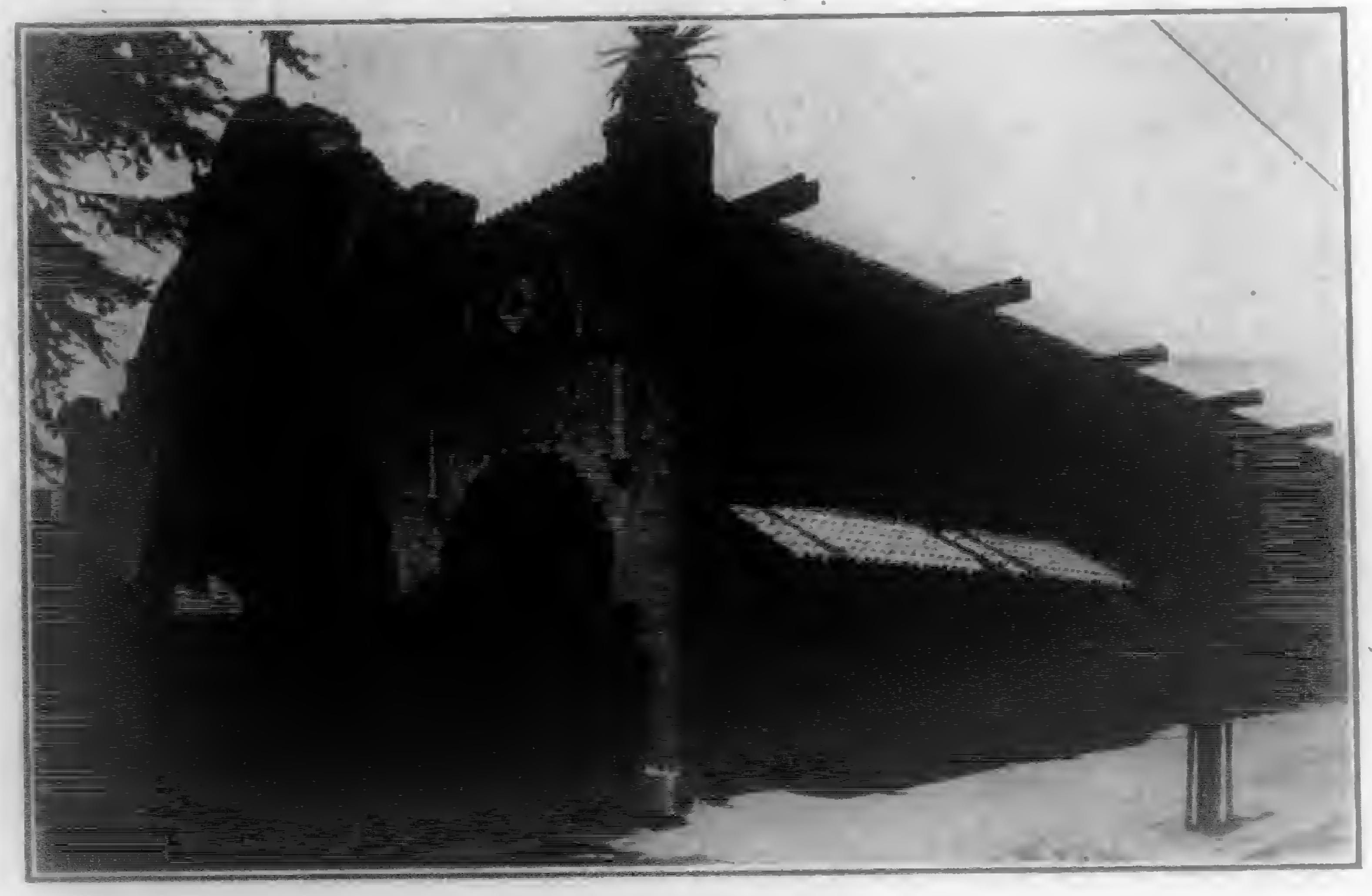
Cafe Building, Idora Park
W. L. Woollett, Architect



Interior Cafe Building, Idora Park
W. L. Woollett, Architect



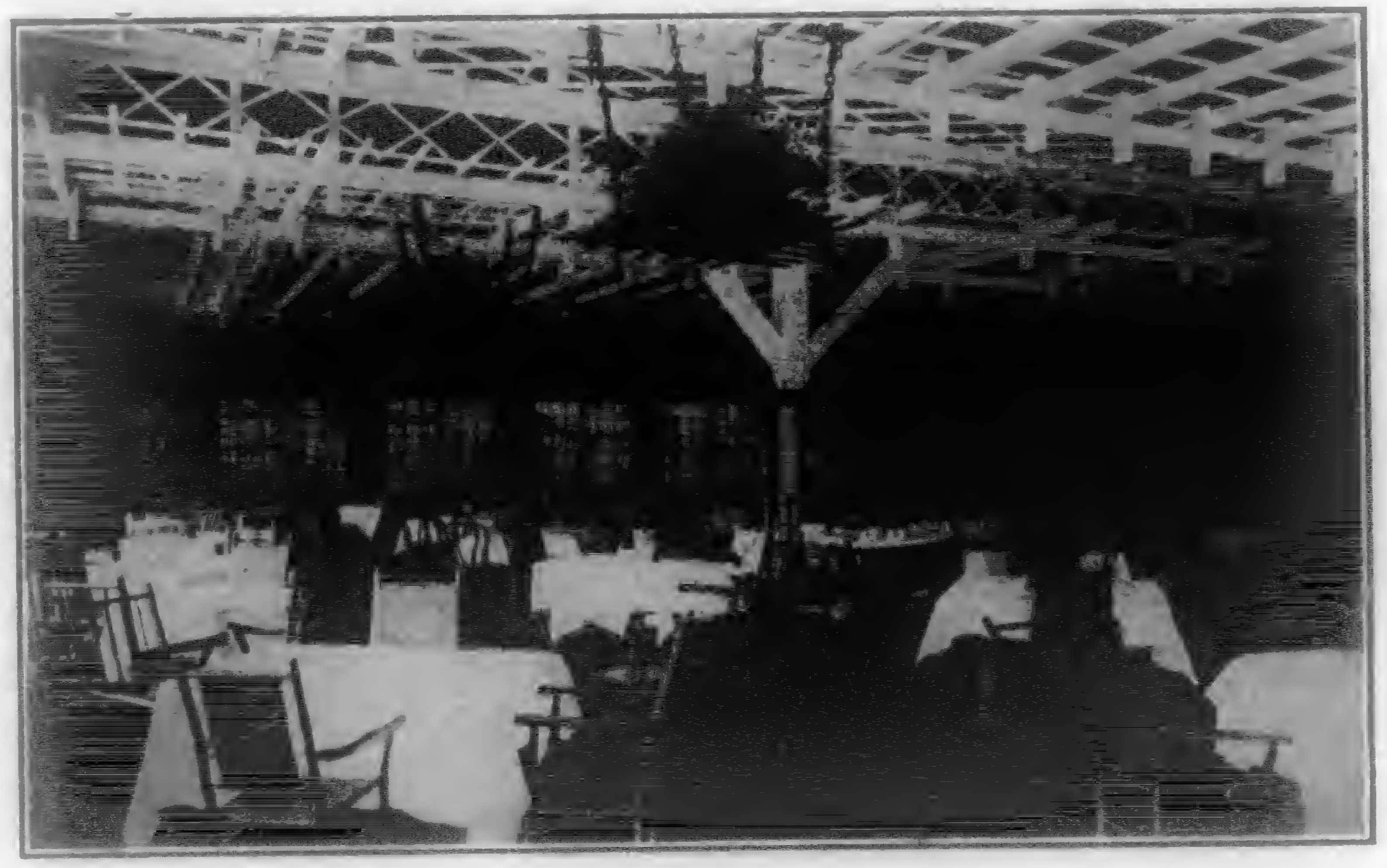
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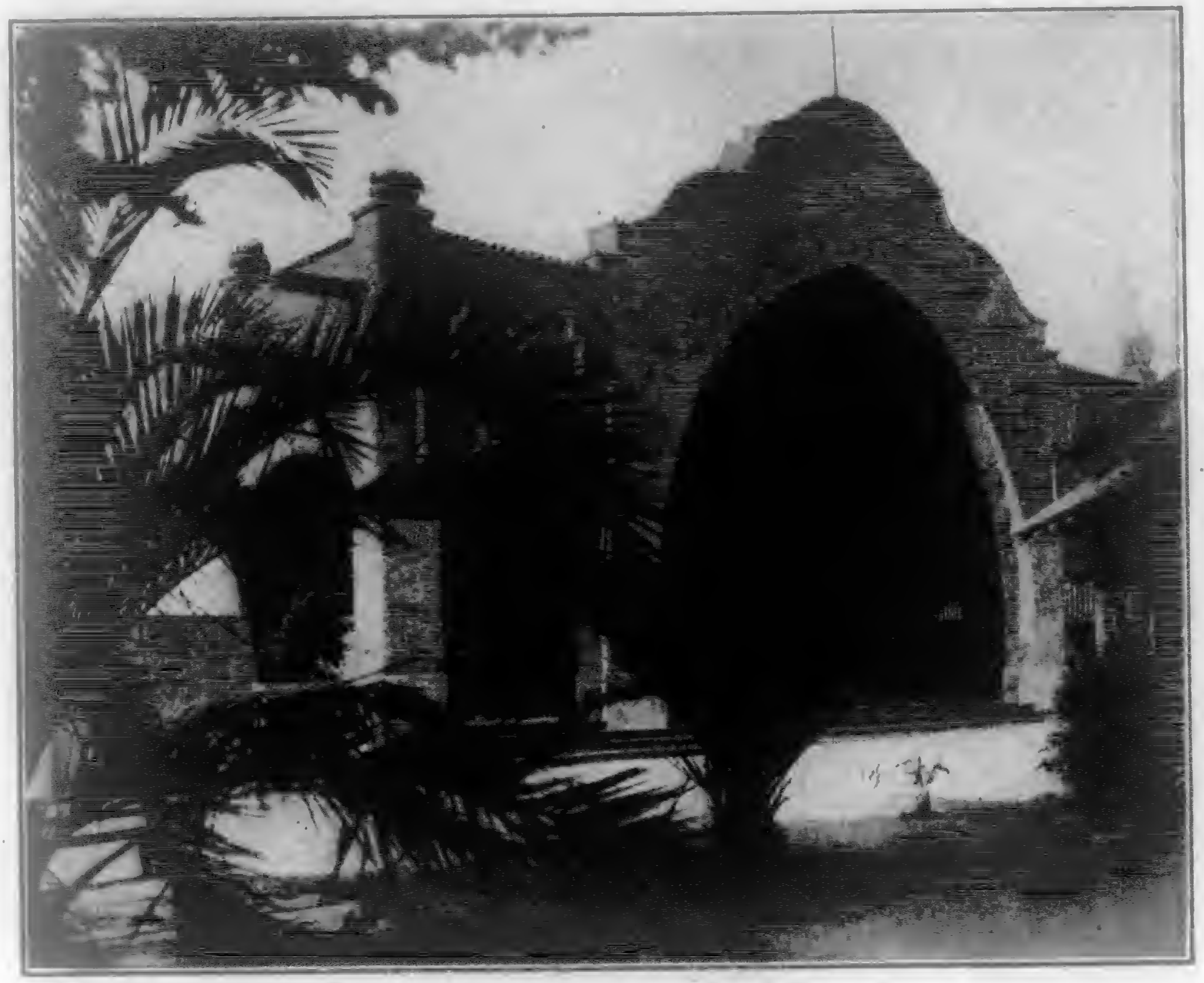
Concession, Idora Park
W. L. Woollett, Architect



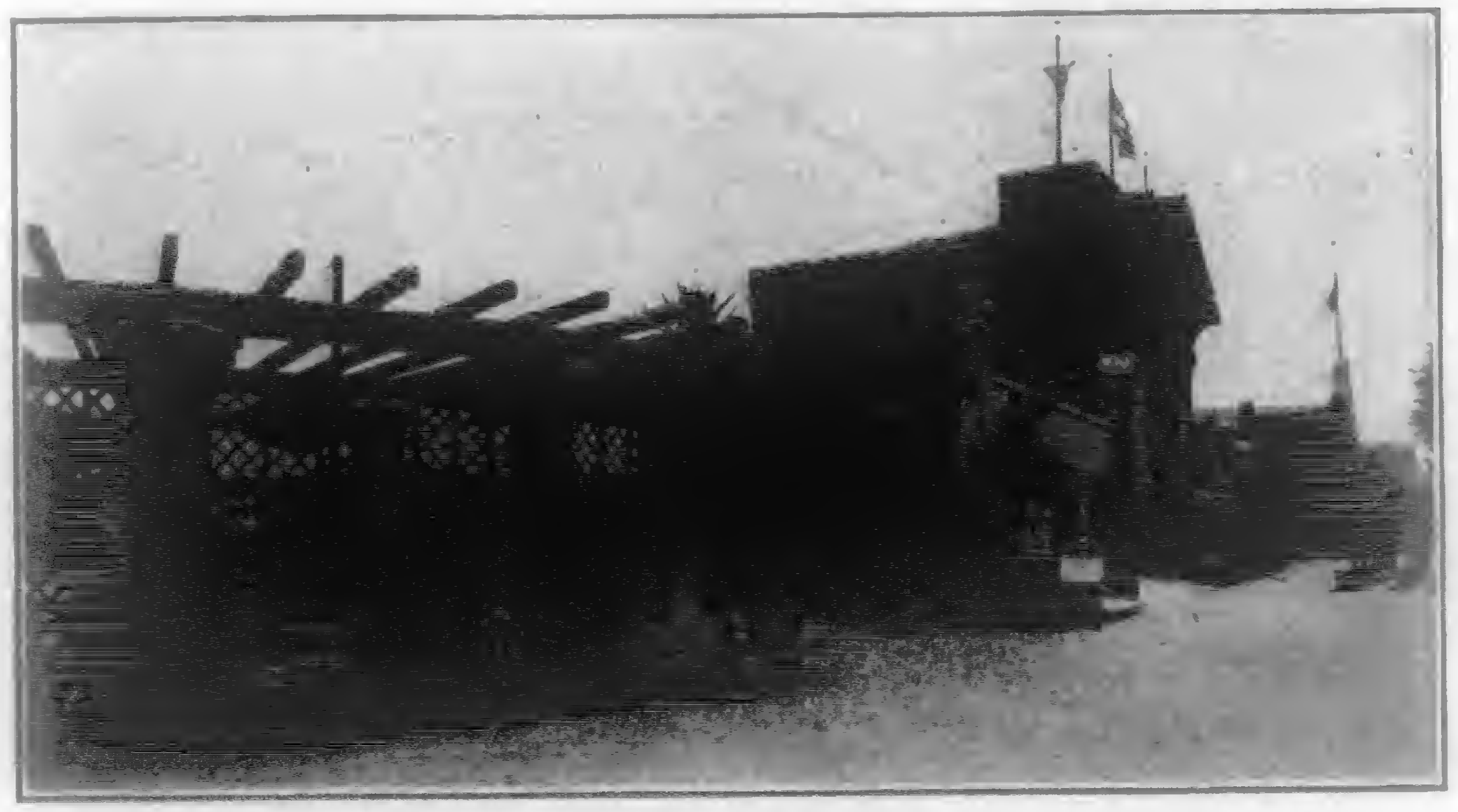
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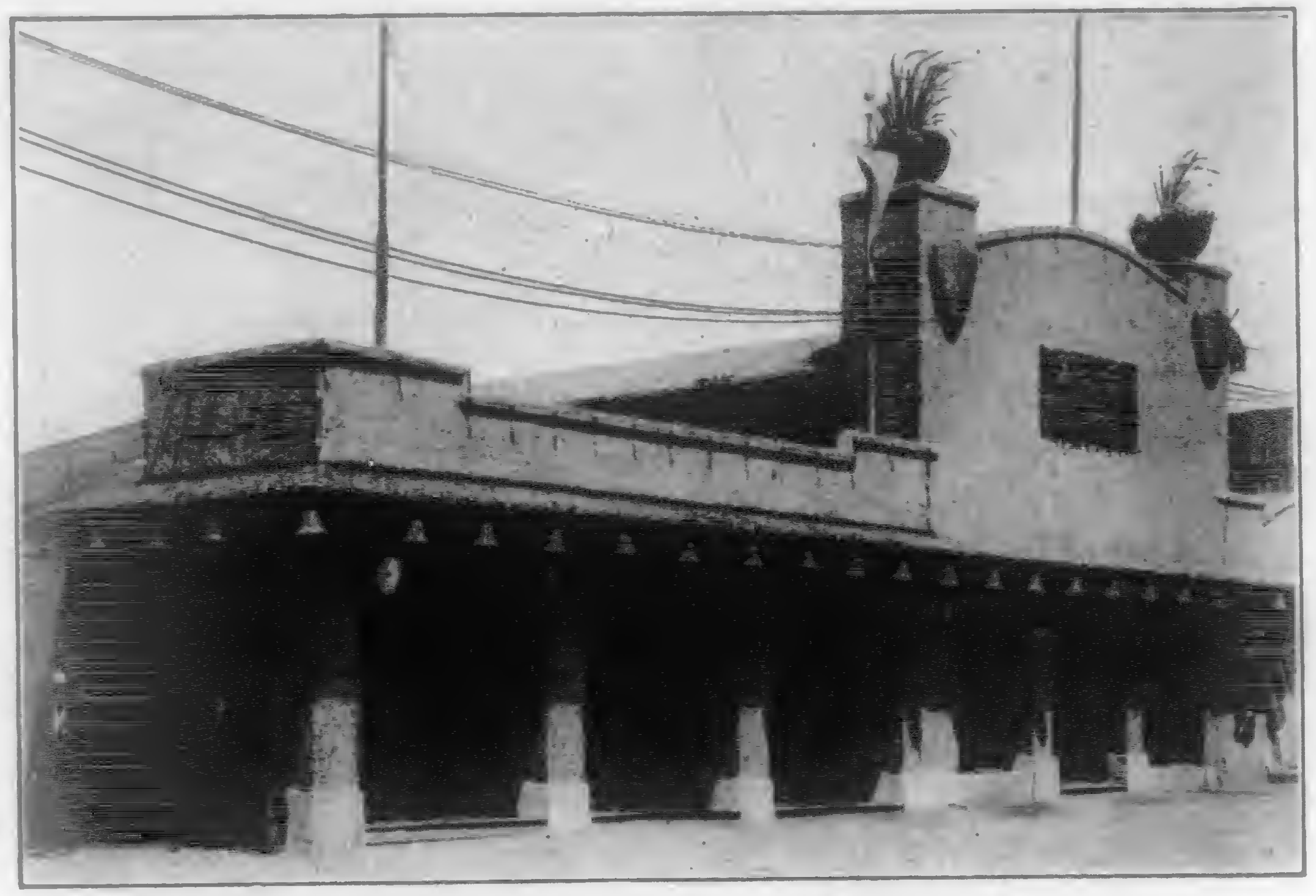
Interior Cafe Building, Idora Park
W. L. Woollett, Architect



Shooting the Rapids Concession, Idora Park, Oakland
W. L. Woollett, Architect



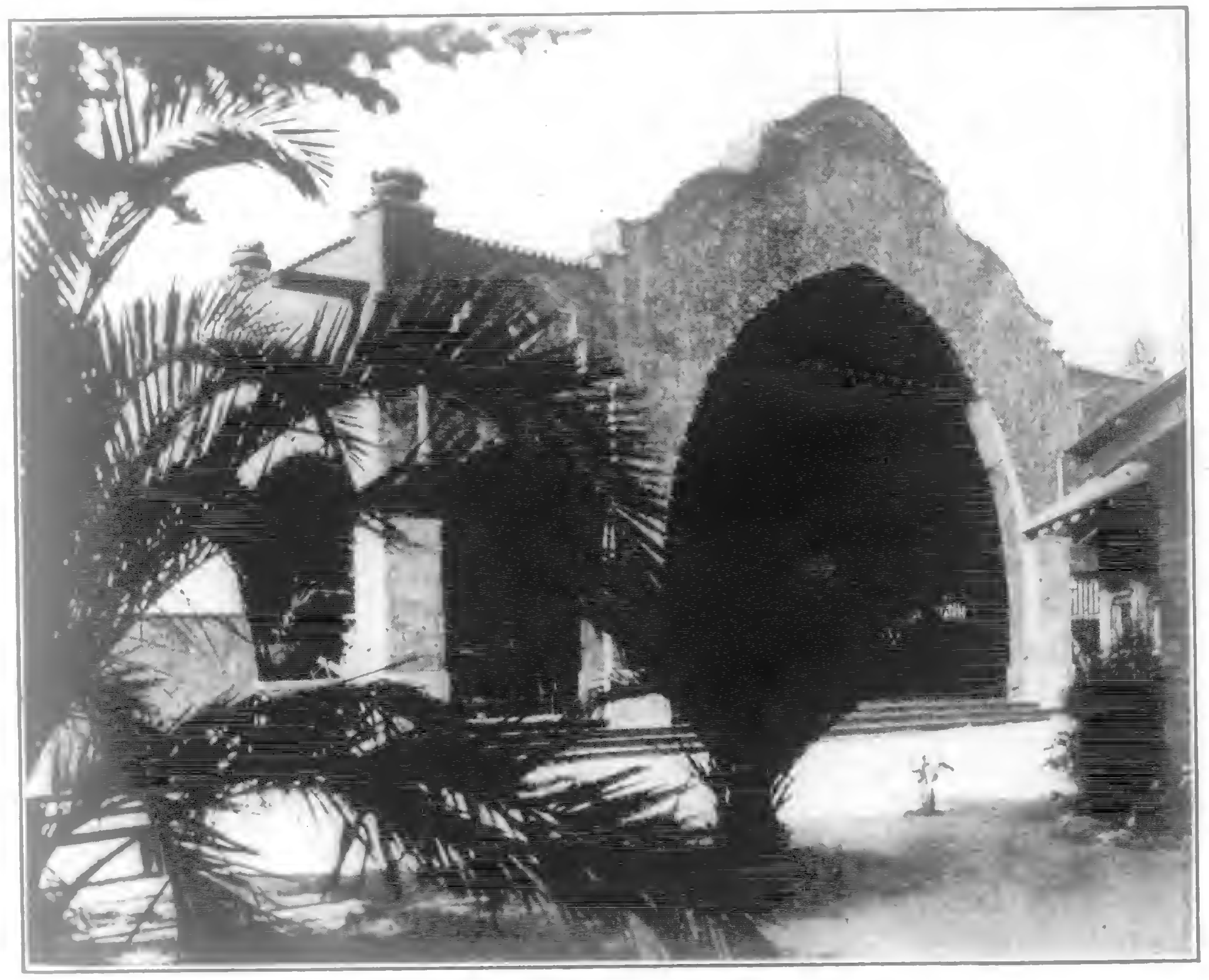
Detail of Swan Pergola, Idora Park
W. L. Woollett, Architect



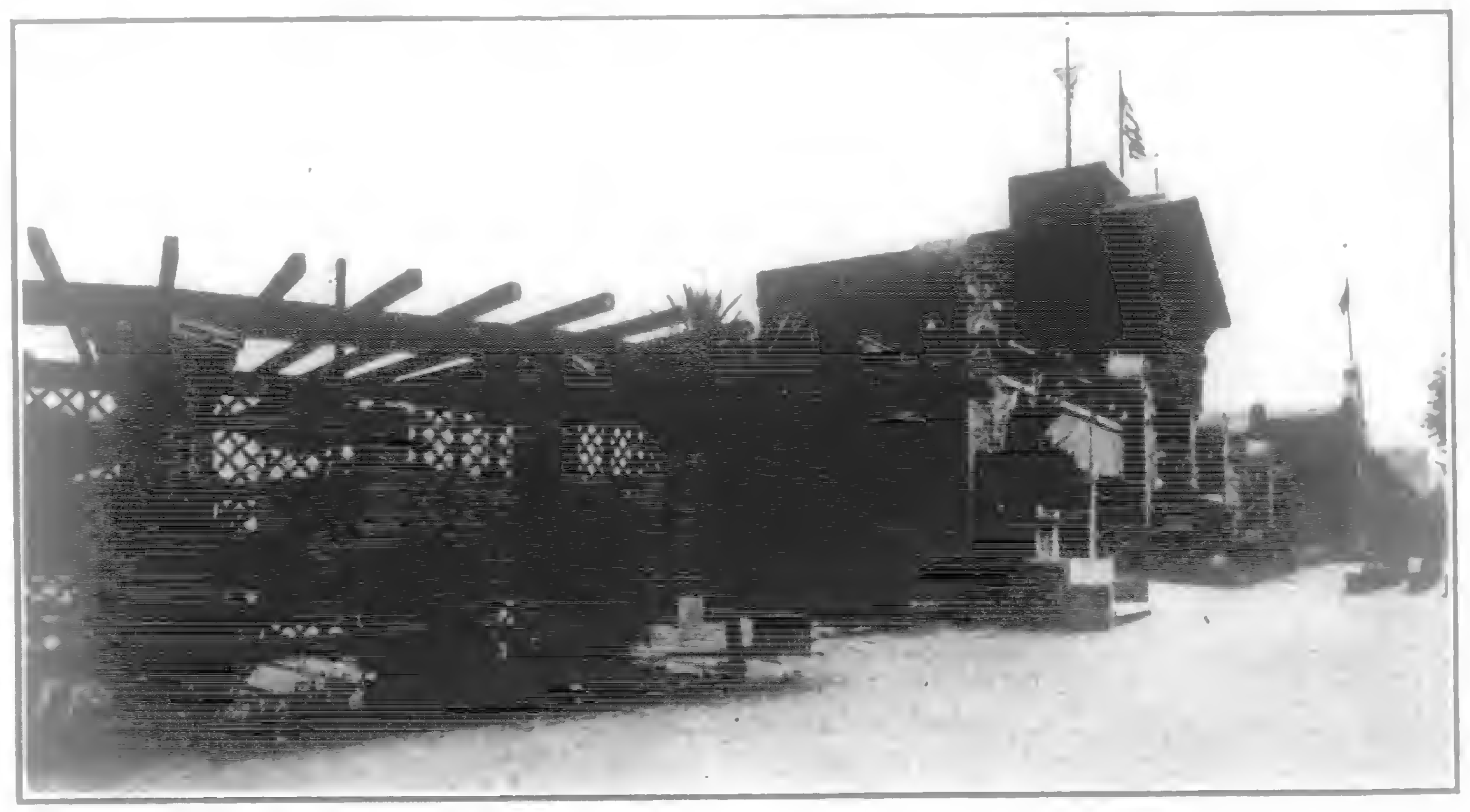
Shooting Gallery, Idora Park
W. L. Woollett, Architect



Another Street View of Wall, Idora Park
W. L. Woollett, Architect



Shooting the Rapids Concession, Idora Park, Oakland
W. L. Woollett, Architect



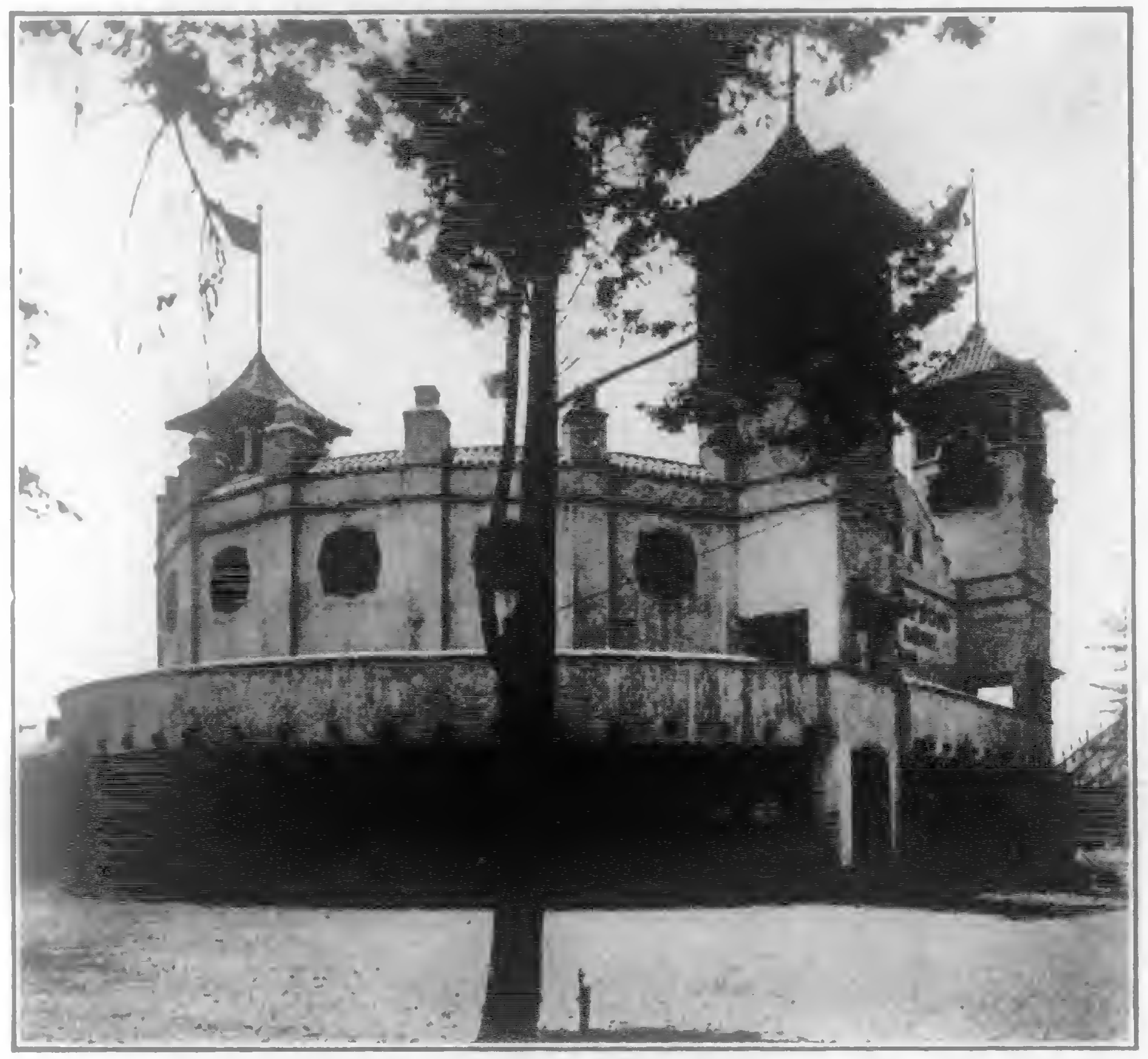
Detail of Swan Pergola, Idora Park
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Shooting Gallery, Idora Park
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Another Street View of Wall, Idora Park
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Scenic Railway, Idora Park
W. L. Woollett, Architect



Concessions, Idora Park
W. L. Woollett, Architect



Tower at Corner of Boundary Fence, Idora Park
W. L. Woollett, Architect

The use of color to spot up the otherwise severe simplicity of the buildings is amusing; for instance, the ends of dark rafters are painted bright cobalt green and a bit of gilt line is introduced as border for same on occasion. Panels in the domes and between wood beams are in soft pastel shades. The dragons in the band stand are one black, one gold, on green background, touched with red, white and gilt. The shell of the band stand is in gold with color ornaments. Flags and pennants specially designed for the place add brilliancy to the color scheme.

On the dome of the restaurant a great lemon-yellow flag with green stein thereon desecrates the blue of the sky. All of the plaster wall surfaces are left in the natural plaster color.

The idea has been just to paint a picture with wood and plaster and tile. The last splash of color is added through nature, as it should be, particularly in California. Masses of red geranium fairly boom their volleys of color; tropical plants and palms rend the blue of the sky into a frieze, and low-hanging, graceful pepper trees lure to shaded walks and the lemon stand.



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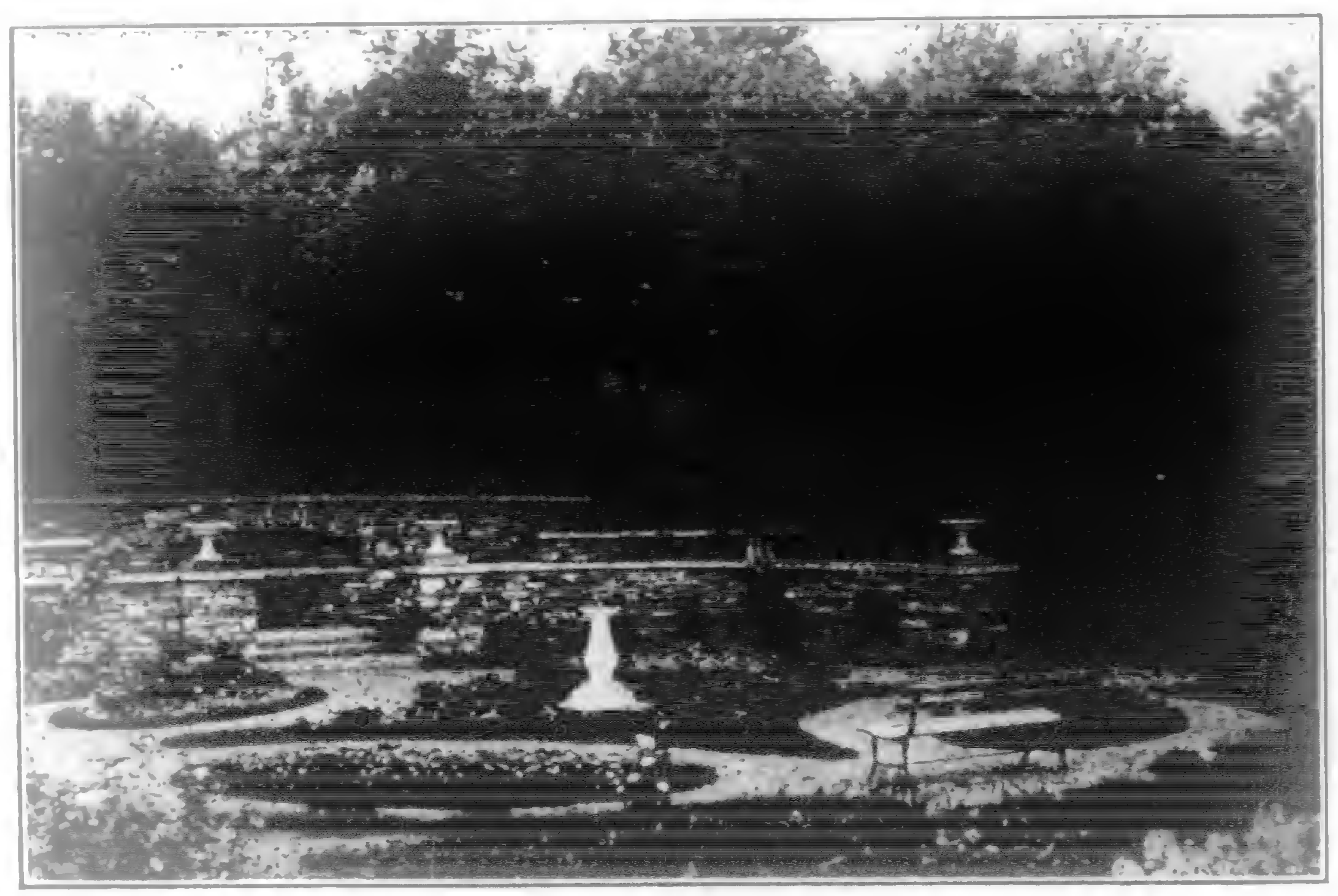
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Entrance Pavilion, Idora Park
W. L. Woollett, Architect



Rose Garden, Designed by
W. L. Woollett, Architect



Fig. 1. Exit from the Music Court
Oscar Albert Prager, Landscape Architect

Landscape Architecture in Oakland, Cal.

By OSCAR A. PRAGER.

[Oakland is fast making for the City Beautiful. While it has no Burnham or civic-center plan, it has parks and lakes and boulevards, and for some time a landscape architect has been engaged in transforming unsightly districts into beautiful parks, with glorious foliage, winding walks, picturesque nooks and restful arbors. In converting Lakeside Park into a beautiful recreation garden Architect Prager has achieved almost marvelous results, and when the scheme has been fully developed Oakland will have good cause for congratulation.—ED.]

LAKESIDE PARK is a peninsula of about forty-five acres, situated in the center of Oakland. On the east, south and west sides it is surrounded by Lake Merritt, a salt water lake connected with Oakland harbor by a small channel, and on the north side it is enclosed by Grand avenue and Perkins street. The peninsula has the character of a bluff. The highest point rises about twenty-eight feet above water level and the western slope falls abruptly ten to fifteen feet to the water's edge. The slope of the east shore is very gentle. The western half of the peninsula is covered with a growth of so-called scrub oaks, but amongst them are about thirty to forty large and very old trees of picturesque appearance. They are grouped around a small cove on the western half of the peninsula.

When the Mayor of Oakland, Mr. Frank K. Mott, asked the writer to plan Lakeside Park it was thought necessary to provide for a band stand and an athletic field. On further deliberation it was decided to use Peralta Park south of Twelfth street, being level and more convenient to car lines as a playground and athletic field, which would make another at Lakeside Park unnecessary.

So the first thing to consider was the best place for the band stand. There were two possible locations, one about in the center of the semicircle formed by the driveway, a very large level space where, with a formal arrangement of the drive, the band stand as center, doubtlessly a satisfactory solution would have been arrived at. But the absence of trees and the consequent exposure of the audience to the sun and the prevailing west winds rendered this situation unfavorable. The other, and finally selected situation, was the cove. The cove formed a natural amphitheater.



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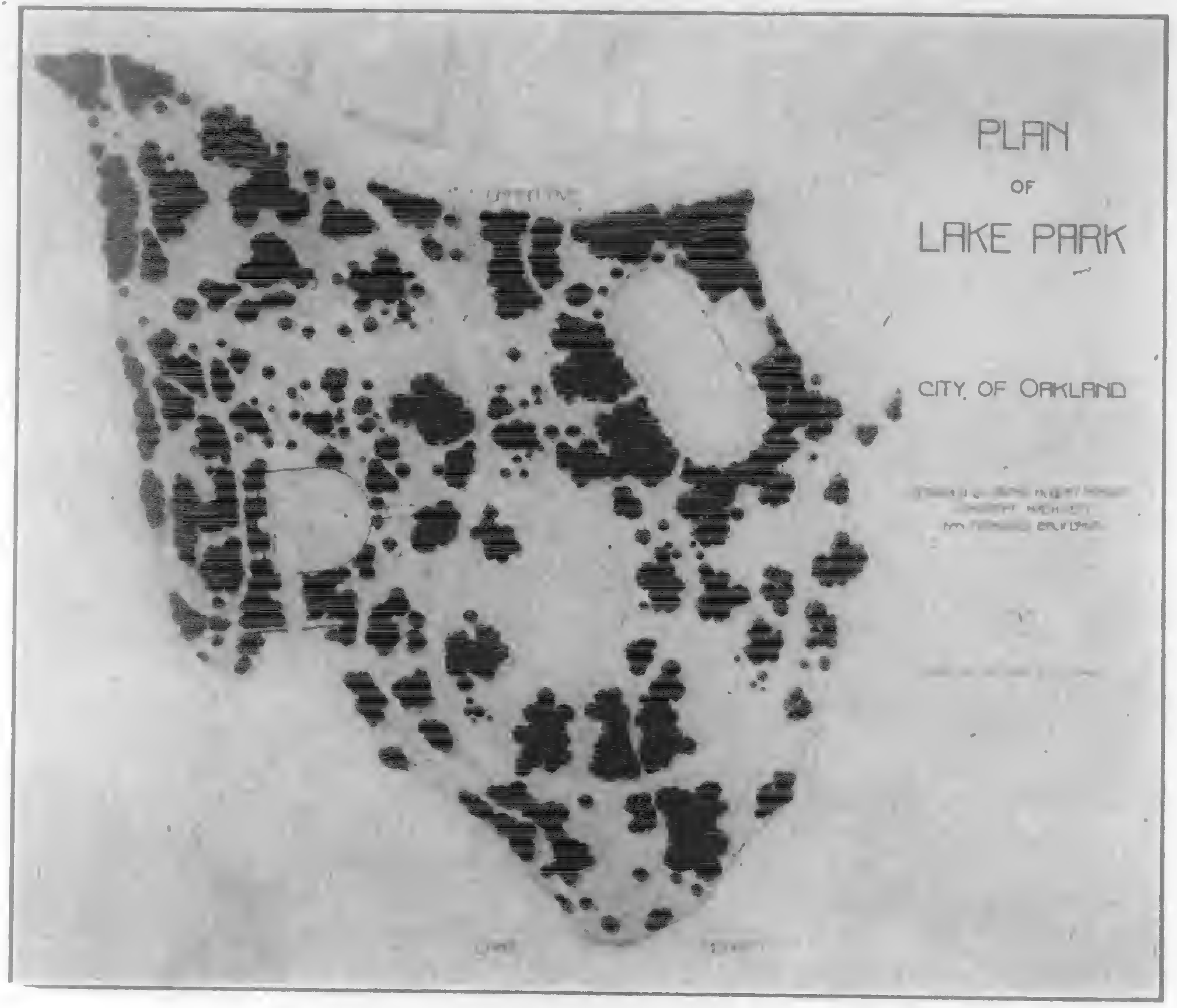
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Plan of Lake Merritt Park, Oakland
Oscar Albert Prager, Landscape Architect

The contour or elevation lines show a distinct semi-circle with a straight base. The logical place for the band stand is in the center of the base line. This has its distinct advantages. The eyes of the audience, usually directed toward the band stand, look due west and not into the sun, which, between 2 and 4 o'clock in the afternoon, stands south to southwest. The restful green of live oaks forms a background to the music stand. The prevailing wind is from the west and carries the sound of the music a great distance into the park.

The band stand and auditorium are designed as a music court somewhat resembling an amphitheater, which impression is accentuated by the surrounding slopes. A balustrade defines the division between the court and the park. The balustrade cuts partly into the side of the slope, so that its top is level with the top of the ground, in which case a stone bench is added to the balustrade. Where it leaves the slope it is treated in the manner indicated by sketch No. 1, showing the exit from the music court to the boat landing. The balustrade is followed by a walk about ten feet wide, four steps lead from it to the auditorium, a large level, graveled space on which 500 benches seating 2,000 people are placed. About 500 more can sit on the stone seats added to the balustrade. To accommodate larger crowds I depend upon the slopes, where they may sit on the lawn amongst the live oaks, as this necessity will only arise on warm and sunny Sundays when neither dampness nor moisture will make sitting on the lawn impracticable.

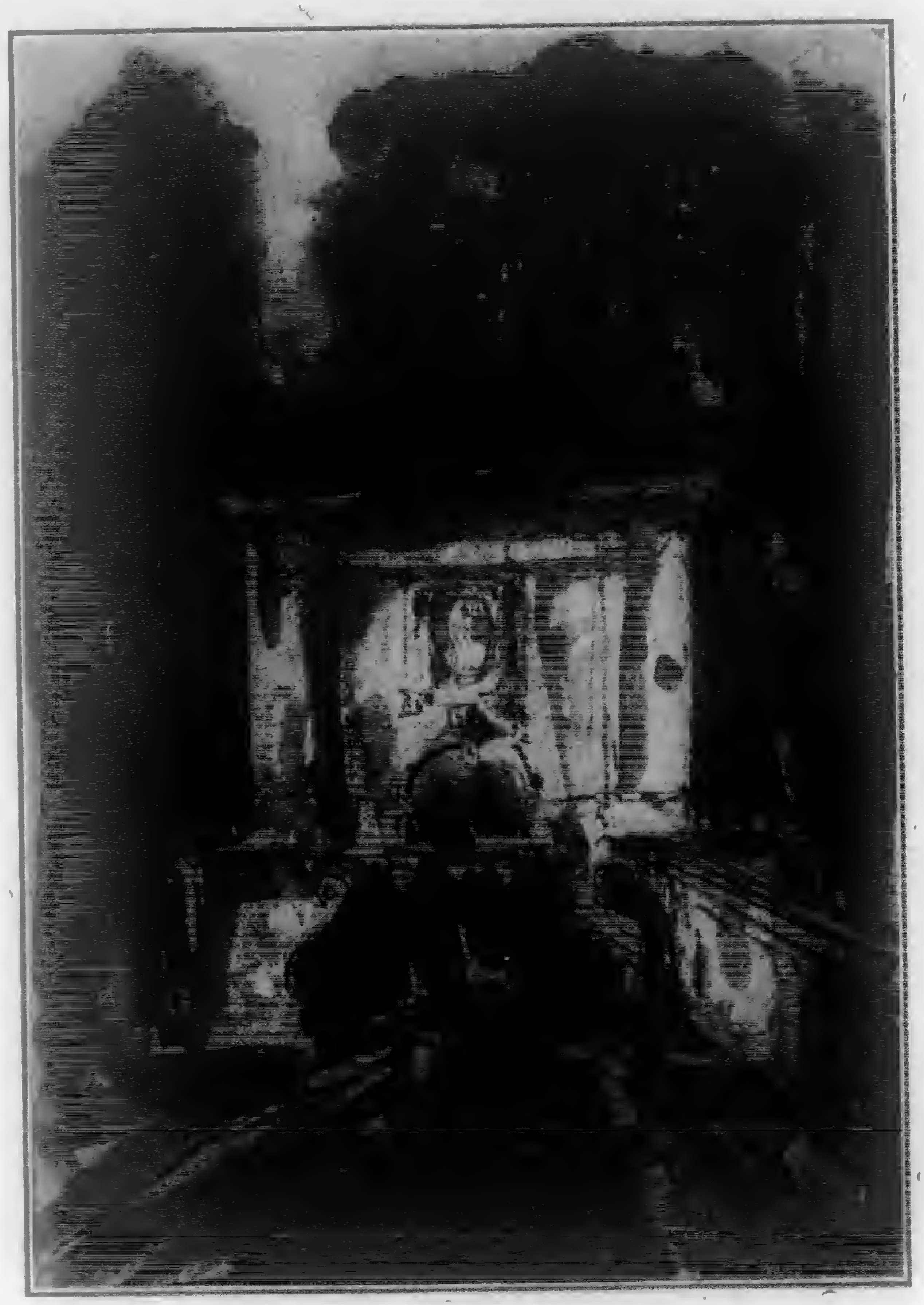


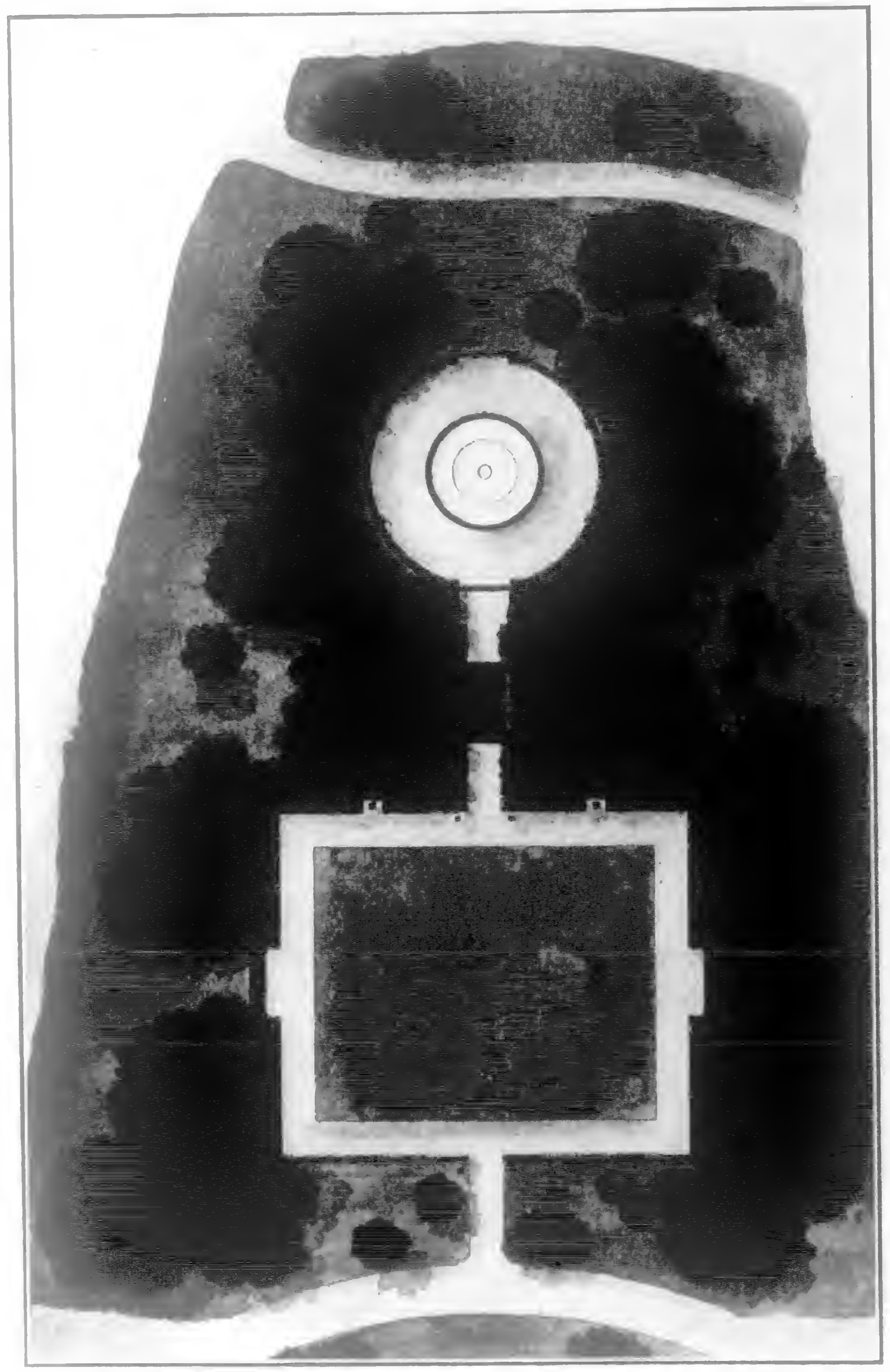
Fig. 3. Drinking Fountain
Oscar Albert Prager, Landscape Architect

A simple design in wood, painted in white or cream color, will probably be used for the benches to avoid the hackneyed wood and iron affairs.

Three entrances lead into the music court and a walk forty feet wide from there to the boat landing. Sketch No. 2 illustrates the boat landing. A path, running parallel to the boat landing, has at its one end a drinking fountain partially built into the slope (Sketch No. 3), at its other end an arbor overlooking the lake.

The paths to and from the music court are designed with the idea of leading large masses of people toward Grand avenue with its car lines, without forcing them to cross the driveway.

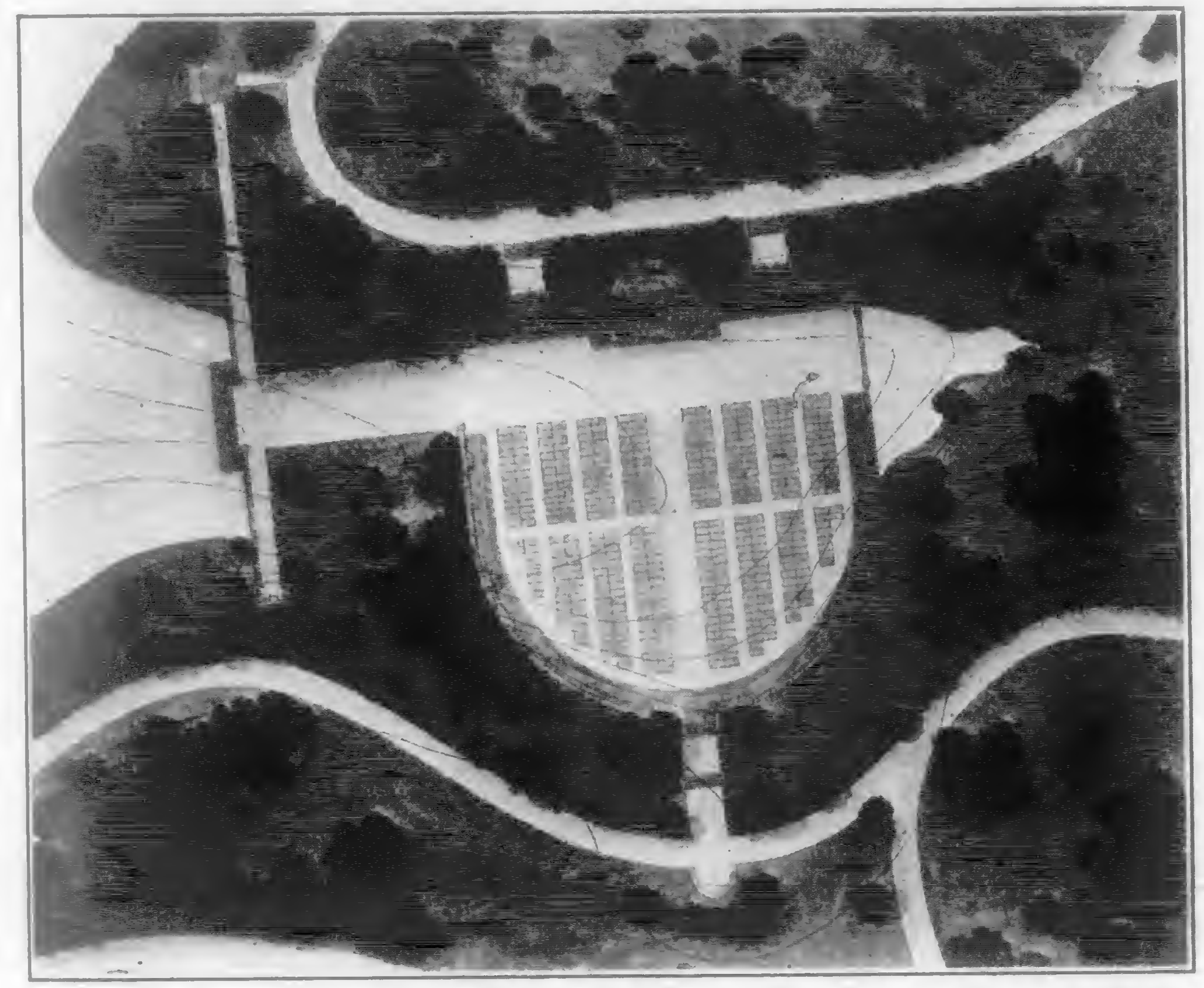
The driveway itself passes near enough to the band stand to give the people using it the enjoyment of the music. The area of the park was thought too small to provide room for a corso or a circle, giving drivers opportunity to pass the band stand again and again. This can, of



Bowling Green and Fountain, Lakeside Park, Oakland
Oscar A. Prager, Landscape Architect

course, be done by following the Perkins street and Grand avenue drives back to the entrance of the park.

A large reservoir for storage purposes is needed and is designed in combination with the fountain surrounded by semi-circular seats. It is situated on the highest point of the park, formerly reserved for the athletic field. This change necessitated also a change in the design of



The Music Court, Lake Park
Oscar Albert Prager, Landscape Architect

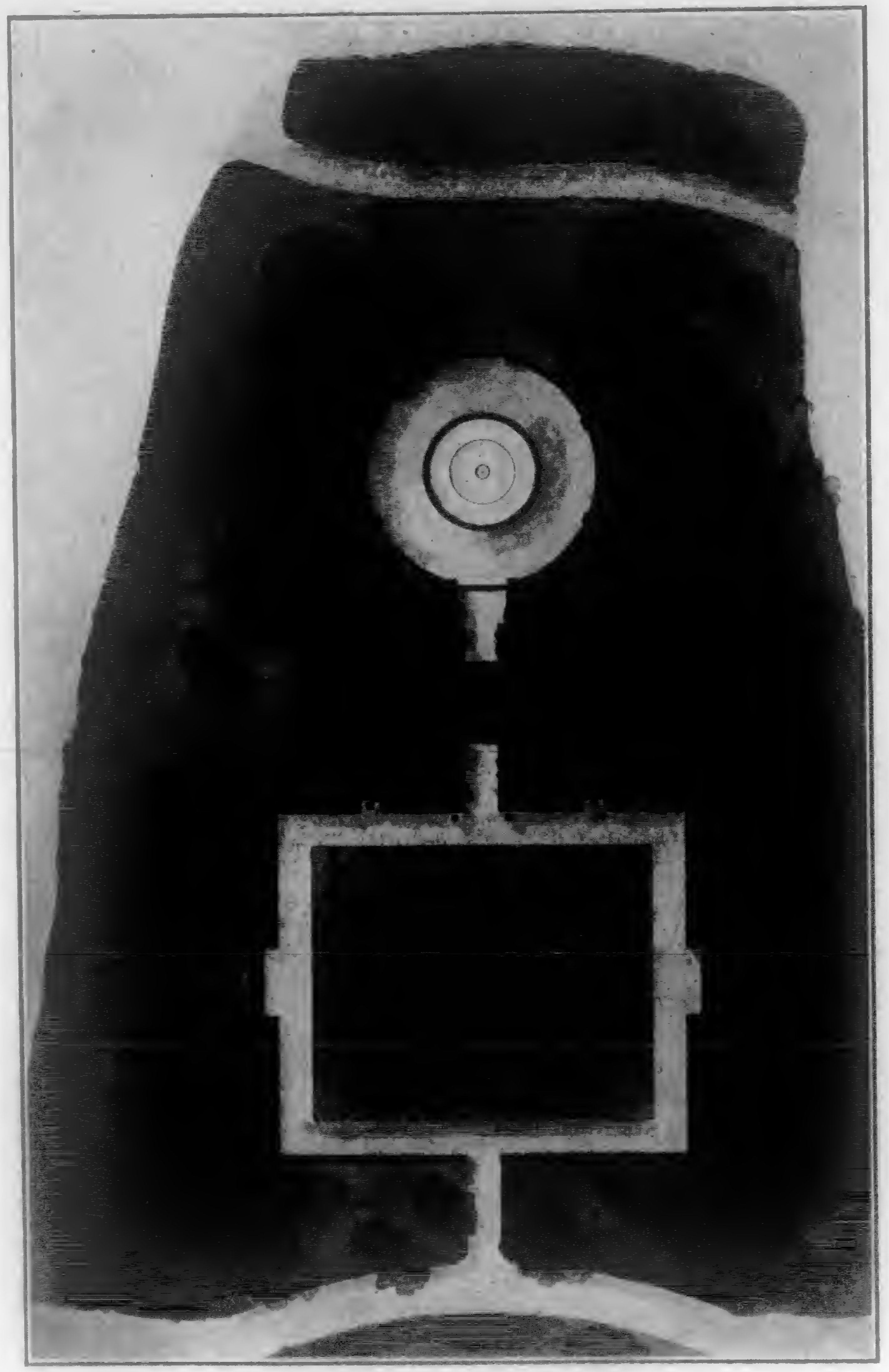
the paths crossing this part of the park. The fountain overlooks a bowling green enclosed by hedges.

The planting of the park will be executed with the idea of accentuating and augmenting the present character of the park. The existing groups of live oaks will be enlarged and multiplied by the planting of deciduous oaks, quercus cerris, rubra and coccinea. The latter two have been selected on account of their brilliant fall color. The uniformity of the dense grove of small live oaks on the western part of the park will be broken by the perpendicular lines of Italian cypress. Large groups of pines (Pinus Austriaca) and birches (Betula Alba Europ.). Madrones and flowering cherries will be planted. No other varieties of trees will be used, which will preserve a unity of effect.

The selection of the shrubs will also be in keeping with the character given to the park by the existing grove of live oaks. The foliage of myrtle, raphiolepis, evergreen azalea, arbutus, toyon berries and others preserves this character. In combination with the pines and birches large masses of Scotch heather will be planted.

Color effects will be obtained by the use of azalea, heather, as many single roses (Rosa rugosa, Cherokee and others) as possible, flowering apple, plum and quince in combination with the cherry trees; plants like creeping Phlox (Phlox Subulata) and tens of thousands of narcissus and crocus.

Many opportunities are given in the park for the placing of statues, for instance, suitable points being at the entrances of the music court, on



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Fig. 2. Boat Landing
Oscar Albert Prager, Landscape Architect

both sides of the band stand, on the balustrade of the boat landing and around the fountain. Hermae or other works of sculpture are suggested, and by these provisions for future dedications by public-spirited citizens or societies it is hoped to make impossible the promiscuous placing of mediocre casts of frock-coated gentlemen.

* * *

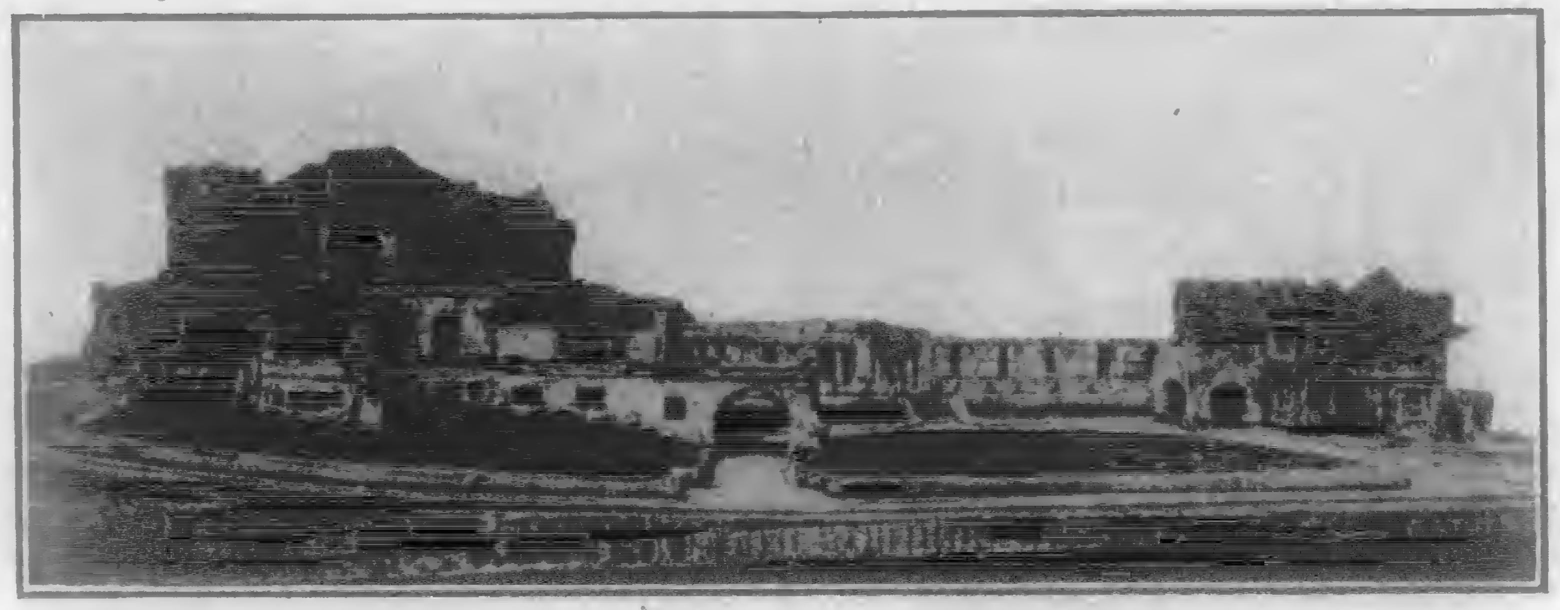
Just Like a Woman

Plumber—Reckless and extravagant—I? When did I ever make a useless purchase?

Wife—Why, there's that fire extinguisher you bought a year ago; we've never used it once.



Art Glass Window, "Bay of Naples," in Residence of
A. A. Dalke, Oakland
A. W. Smith, Architect



Street View of the H. H. Hart Residence, Berkeley
Dickey & Reed, Architects

Residence for Mr. H. H. Hart at Claremont, Cal.

By C. W. DICKEY, Architect.

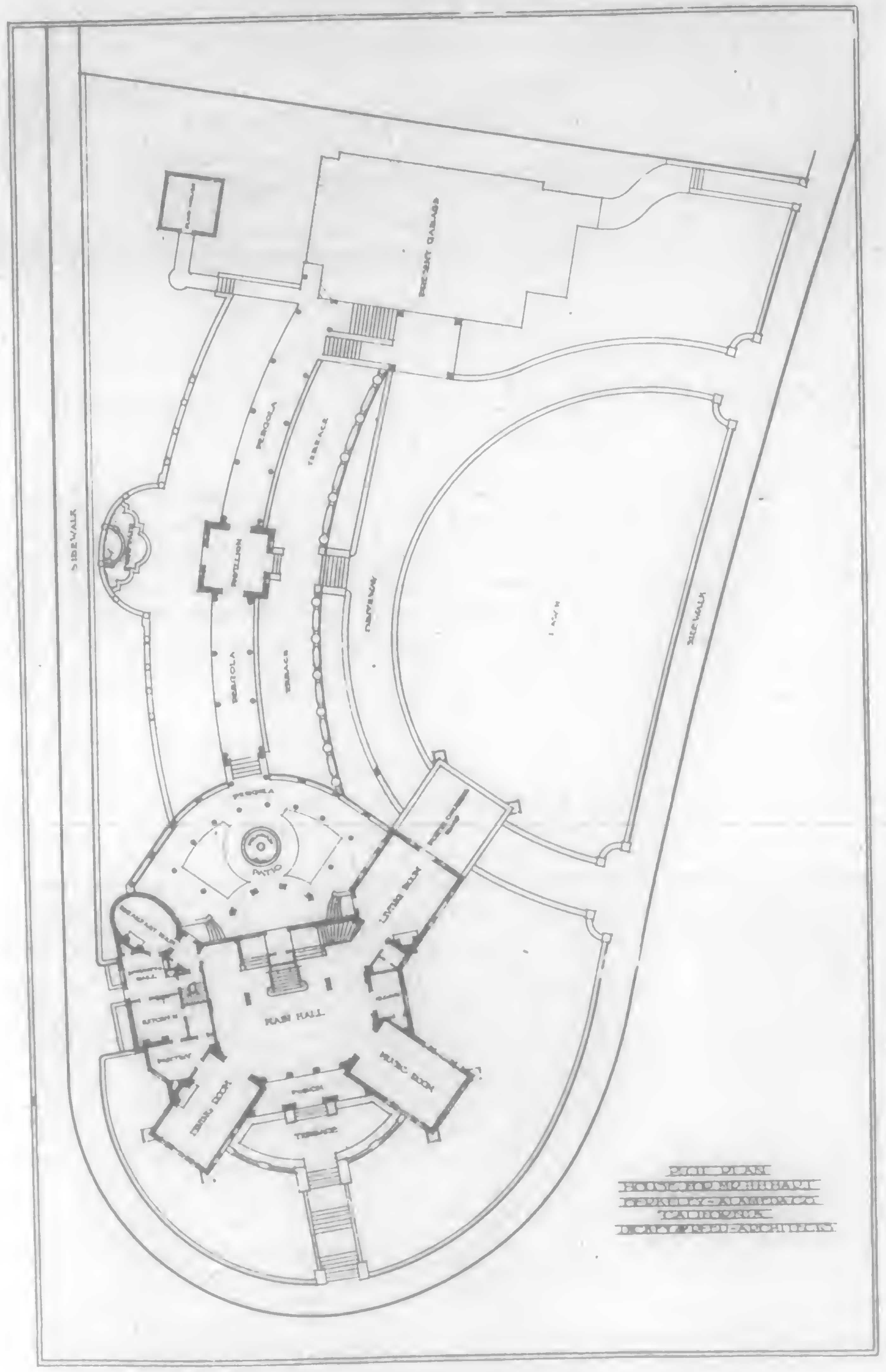
THE house is located a few hundred yards to the south of the Claremont Hotel in the Berkeley hills. It stands on high ground overlooking the bay, Berkeley, Oakland and the Claremont Hotel. The lot is oblong, occupying the point of land formed by a winding street and surrounded on all sides but the south side by this road. The lot is rather small for so elaborate a building scheme, but the fact that the lower side of the road is occupied by the grounds of the hotel relieves the situation, as these grounds will later be beautified.

As seen on the plot plan there are two buildings, the new residence and a garage, the latter with living apartments on the second floor. The garage was built several years ago, and is now used as a temporary home by the owner. These buildings are connected by a pergola, and the garden between is treated in terraces with a high garden wall and fountain near the rear of the lot.

The residence is designed in harmony with the existing garage and is a compromise between the Italian and Spanish renaissance styles. The exterior is of cement stucco and the roof is of red tiles. The basement walls, pergola columns, etc., are of concrete and the remainder is of wood frame construction, with a considerable number of castiron columns and steel girders.

The main feature of the house is its openness. The main hall reaches entirely through the house, and the diagonally projecting wings afford windows on three sides of all the principal rooms. These windows are unusually large, affording the maximum amount of view of the surrounding country. The wall spaces in the rooms are correspondingly small, but the owner considers that the views of nature obtained through the windows will be more beautiful than any pictures that might adorn the walls.

The house faces toward Mt. Tamalpais, so that every room obtains sunshine, and most of the rooms get a beautiful view of the bay. As one enters the main hall from the front entrance he looks directly through the house into the patio in the rear, while directly in front of him is a broad stairway leading up to an ample conservatory on the stair landing. To right and left the music room, living room, dining room and breakfast room open diagonally from the four corners of the great hall.



Plot Plan of Residence for Mr. H. H. Hart, Berkeley, Cal.
Dickey & Reed, Architects



Plaster Model of the H. H. Hart Residence, Berkeley
Executed by Callaghan & Manetta
Dickey & Reed, Architects

The porte cochere entrance is in the basement, with a broad stairway leading to the main hall. On the basement floor are dressing rooms and a billiard room, besides the service basement containing storerooms, vaults, boiler room (fireproof), laundry, wine room, etc.

The upper floors are devoted to sleeping apartments, baths, etc., a study for Mr. Hart in the northwest corner on the second floor and a lookout room in the same corner in the tower. A large loggia on the second floor affords a comfortable lounging space, and there are three sleeping porches on the rear.

The porches, walks, etc., are to be paved with rough red tiles.

The interior will be finished for the most part in hard woods, and the designs for the principal rooms are in harmony with the exterior. The general color scheme for the first floor will be bronze green, bown and dull gold.

The patio with its electric fountain, the sweeping pergola, with a pavilion at its center, and the terraces, garden walls, wall fountain, etc., with balustrades, garden pots, garden seats, flower boxes, sun dials, etc., will make a very effective garden, quite Italian in its feeling.

The building and landscape features will cost about $25,000.

* * *

English Coffee

The American opinion of coffee as understood in the English home is not high, and how the coffee of the English lodgings is esteemed may be understood from the following traveler's tale. It was his first morning in London "apartments," and his landlady came up with the breakfast, and as he began the meal opened a slight conversation.

"It looks like rain," she said.

"It does," replied the American; "but it smells rather like coffee."—London Chronicle.



Second Avenue Seattle Paved with Vitrified Brick in 1895. Photo taken in 1908



Union Street, Seattle, Paved with Vitrified Brick.



Pike Street, Seattle, Paved with Vitrified Brick in 1893. Photo taken in 1908

Street Paving in the Pacific Northwest*

By WALTER C. HOWE,
Superintendent of Streets, Oakland.

DURING the past year the writer has visited every city of importance upon the Pacific Coast, from San Diego to the Canadian boundary, and has no hesitancy in saying that in point of high-grade street improvements, Seattle easily ranks first.

Seattle cannot be too highly commended for the splendid area of paved streets that extend in all directions from her civic center. Accompanying this report is a series of photographs showing different streets and street pavements throughout that city. These photographs are very instructive and show to what extent the standard paved area in Seattle has been carried. Residence streets miles away from the business district are splendidly paved with asphalt. This condition is not an exception, but the general rule.

The people of Seattle have been educated to the value of permanently paved streets, and, where heretofore it required much effort on the part of the city officials to pave a certain area or district, owing to many protests, today there is hardly a dissenting voice when such improvements are proposed. Property that heretofore lay idle a portion of the year for want of tenants has been leased for long periods, rented regularly or sold at an increased valuation in hundreds of instances, the permanent paved area having improved traffic facilities and general conditions. This city carries on its work upon a large scale. Large districts are selected for improvement at one time and contracts are let involving hundreds of thousands of dollars.

The business section of Seattle, and the warehouse district contiguous, have been paved almost exclusively with vitrified brick and sandstone block. The value of a good vitrified brick is here demonstrated to the fullest extent. The writer inspected streets laid with this class of

*Extracts of a report made by Mr. Howe to the Oakland City Council.



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The business section of Seattle, and the warehouse district contiguous, have been paved almost exclusively with vitrified brick and sandstone block. The value of a good vitrified brick is here demonstrated to the fullest extent. The writer inspected streets laid with this class of

*Extracts of a report made by Mr. Howe to the Oakland City Council.

paving material and now ranging in age from one to seventeen years. Their present condition would convince the most skeptical of the great wearing qualities of a high-grade vitrified product. On First and Second avenues, streets similar to Broadway and Washington streets, the earliest product of the Denny-Renton Clay and Coal Company, was laid, and although the traffic upon these streets is enormous, the Engineering Department claims that not one cent has ever been spent upon these streets for repairs. Many engineers maintain that vitrified brick are not suitable for streets subjected to heavy traffic. Seattle's experience is a refutation of this theory and practical experience is the convincing test. The first vitrified brick street laid in Seattle, First avenue, between Yessler and Washington, is nearly eighteen years old, and, although in a district subjected to the heaviest kind of traffic, is still in good condition.

Classes of Pavements.—At the present writing there are four classes of permanent pavements laid by the municipality, viz:

Sandstone Block, Standard Asphalt, Wooden Block, Vitrified Brick.

All of these pavements are laid upon hydraulic concrete foundations varying from four to six inches in thickness according to the district in which laid and consequent traffic conditions. Sand cushions are, of course, used with the block and brick pavements.

Prices for Street Paving.—Prices for the above work run about as follows:

Sandstone block	35c to 50c per square foot.
Wooden block	30c to 40c per square foot.
Standard asphalt	20c to 24c per square foot.
Vitrified brick	28c to 35c per square foot.

Mileage of Pavements.—The mileage of permanent pavements in Seattle up to May 31, 1909, was:

Sandstone	7.62 miles.
Vitrified brick	11.42 miles.
Wooden block	.14 miles.
Standard asphalt	69.24 miles.
Total	88.42 miles.

Seattle's experience with different classes of permanent pavements is summed up in the following:

Sandstone Block.—This class of pavement is giving excellent satisfaction. It is laid upon grades that have been considered prohibitive in some cities. It is not unusual to see sandstone blocks laid on 18 per cent. grades both in Seattle and Tacoma. Horses, however, are shod with heavy calking irons in order to avoid slipping during wet or frosty weather. There is but little difference between the Seattle granite and sandstone blocks and the California basalt block pavement. Prices are very similar and if anything the basalt is preferable, owing to extreme toughness and hardness.

Wooden Block.—This class of pavement has only recently been laid, and the experience of Seattle is therefore too recent to be of benefit to outside cities.

Standard Asphalt.—There is but little difference between the asphalt pavements as laid in Seattle and those laid in Oakland. Seattle uses a one-inch binder course with two inches of surface material, while our own specifications call for a two-inch binder with one and one-half inch of surface asphalt. In the Seattle semi-business districts the foundation is six

inches in depth, while in residence sections the maximum thickness is four inches. The pavements are very hard and firm and show but little effect from calking under traffic in hot weather. Vitrified brick gutters are laid in most instances.

A ten-year guarantee has heretofore been required from all contracting firms. This guarantee period has recently been reduced to five years, owing to the action of bonding companies in refusing to insure standard asphalt pavements for a longer period.

The five and ten-year guarantees require the contractor to keep the pavements in first-class condition and to make good any failure or deficiencies appearing during the life of the guarantee. The municipality enters into a separate contract in order to secure the above guarantee and pays the contractor a certain rate per square yard per annum. The purpose of the guarantee as expressed by City Engineer Thomson is to promote legitimate contracting and avoid the possibility of an inexperienced firm laying asphalt pavements for several years and then abandoning the field when exposed by inferior work.

Vitrified Brick.—The vitrified brick used throughout the State of Washington is supplied by one concern, the Denny-Renton Clay and Coal Company. The writer visited their brick plant at Renton and also inspected the beds of shale from which said brick is made. Repeated chemical analysis of the shale give the following average results:

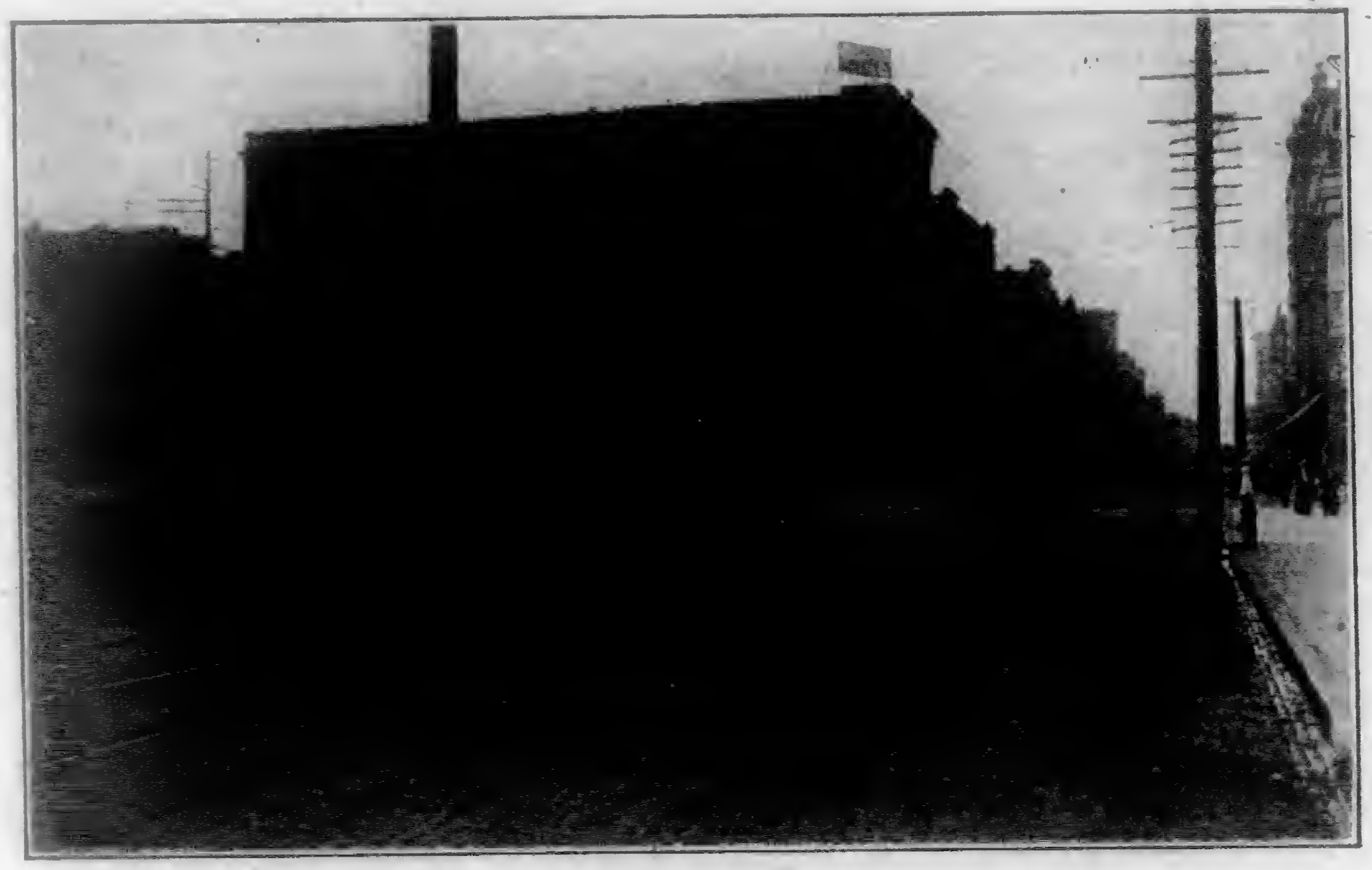
Silica (SiO_2)	57	per cent.
Alumina (Al_2O_3)	23	per cent.
Loss (combined water)	8.7	per cent.
Clay, base and sand	88.7	per cent.
Iron Oxide (Fe_2O_3)	5.6	per cent.
Lime (CaO)	2.38	per cent.
Magnesia (MgO)	1.50	per cent.
Undetermined (alkalies)	1.82	per cent.
Fluxes	11.30	per cent.
Total	100	per cent.

The above results compare very favorably with standard Eastern shales.

The most important tests prescribed by the Engineering Department to determine good brick are the rattler test, showing loss by impact and abrasion, and the absorption test to determine specific gravity. There are also a number of practical tests used by the City's Inspectors, among which may be mentioned the fracture test, sound test, shrinkage test and water test.

Practical experience, however, is Seattle's greatest test, and where the brick are brought in free from laminations and distortions, present a cherry red surface color, fracture fairly even and uniformly and show a homogeneous cross section after such fracture, they usually stand all requisite tests. The process of annealing is very important. Twenty-three days are required to turn a kiln. During this period the temperature slowly raises to about one thousand degrees Centigrade and just as slowly decreases.

The Denny-Renton Company make three separate tests of every kiln of brick burned. These tests are filed daily in their city office and are



First Avenue, Seattle. Paved with Vitrified Brick in 1893. Photo taken in 1908

open for inspection. Three different grades of brick are found in each kiln as determined by these tests, viz:

1. Upper tier; brick receiving the greatest heat. They are usually hard but not tough enough for paving.

2. Center tier; usually well burned to point of fusion and properly annealed. All these brick are known as No. 1 product and are strictly first-class pavers.

3. Lower tier; usually underburned and badly distorted. Sold as common brick for building purposes.

The percentage of culled brick varies from 5 per cent. to 30 per cent. The standard size of brick is 2½x4x8 inches. The present price, F. O. B. Seattle, is $20.00 per 1,000. Owing to excessive freight rate the cost of same brick laid down in Oakland would be $30.50 per 1,000.

Mention has already been made herein of the success of vitrified brick as a paving material in Seattle and it is useless to dwell further upon the subject. I desire, however, to quote the following words of City Engineer Thomson, i. e.:

"Vitrified brick is the best and most economical paving material laid today. The first cost is a trifle high but the difference is soon made up in maintenance."

The above applies, of course, only to brick streets well and properly laid and with only the best material and workmanship. Vitrified brick streets are laid in Seattle upon all grades up to and including 6 per cent.

Tacoma.

The City of Tacoma carries on a policy of street improvement similar in many respects to Seattle.

The classes of pavements used are the same. Vitrified brick and sandstone block are used in semi-business, business and warehouse districts. There are many steep grades in Tacoma and in most instances sandstone block is used thereon. Standard asphalt is also a popular pave-

ment. The lower districts of the city contiguous to freight yards and railroads are well paved and present a very pleasing appearance to the eye.

Portland.

Portland, Oregon, is well up the line in civic improvements and has approximately twenty miles of permanent pavements under way this year. When we consider that our own city has been averaging about two miles of permanent paving per year one can realize the magnitude of Portland's present street work. Up to July 31, 1909, this city has laid and maintains the following mileage of permanent pavements:

Pavement	Miles
Standard asphalt	14.97 miles.
Bithulithic (asphalt macadam)	20.58 miles.
Bituminous macadam	.15 miles.
Hassam (concrete pavement)	.56 miles.
Vitrified brick	1.00 miles.
Wood block	1.95 miles.
Stone block	5.51 miles.
Total	44.72 miles.

As will be noted, bithulithic is the most popular pavement. This pavement is similar to the aphalt macadam pavements laid in Oakland. It is usually laid upon a well compacted sub-grade and in depths varying from six to seven inches. The base course is composed of a three-inch basalt rock, well watered and rolled. This course is covered with a heavy asphaltic binder and the entire mass rolled with 10 to 15-ton steam rollers until thoroughly set. The surface course is composed of six sizes of finely graded rock, varying from two inches to dust. This is so proportioned as to reduce all voids to about 10 per cent. The whole is thoroughly mixed by machinery with a special bituminous compound and heated to about 250 degrees F. This mixture is spread while hot to such a depth that after compression with a 10 to 15-ton roller it will have a thickness of two inches. A flushing coat is then applied to seal up all pores in the surface and fine screenings spread over entire width of roadway. This pavement is laid without a concrete foundation, but the base course of rock is so thoroughly compacted and bound together that the general effect of a standard concrete foundation is obtained, with great elasticity. The finished surface is rough and not as pleasing to the eye as standard asphalt, but the effect of continuous traffic soon obviates this condition. The writer inspected many streets paved with bithulithic ranging in age from one to seven years and found them in excellent condition in every instance. This pavement is laid in the business, semi-business and residence districts and is subjected to varying kinds of traffic. The results thus far obtained have been very satisfactory.

Standard asphalt is the next pavement in point of popularity in Portland. There is little difference between this pavement as laid in Portland and as laid in Oakland. The excellence of this class of construction is too well known to require any discussion here.

Hassam concrete pavement, similar to the roadway laid across the Alameda marsh, is being installed in Portland at this writing. The finished pavement presents a nice appearance. Portland's experience with the pavement will be of value to outside cities at some future date.

Wooden block pavement in Portland has given only indifferent success and the present condition of the city's wooden block streets is ample evidence.

Vitrified brick has not been a success in Portland. The few blocks laid are now in bad condition. Some of these streets were laid with brick obtained from local companies. Many of the brick appear to be improperly annealed, very porous and lack the homogeneous appearance of the high-grade product.

A Progressive Street Improvement Policy.—The City of Portland is carrying on a strong policy of street improvements. Permanent pavements extend for miles into the residence section; even the heights back of the city are paved with high-grade pavements. East Portland is extending standard asphalt and bithulithic to the very limits of the city. The district plan of improvement is carried on here upon a large scale. The policy of the city is to avoid improving single blocks here and there, but to reach out and carry the permanent pavement area into large districts adjoining pavements now laid.

One of the most interesting and noticeable features of Portland's street work can be seen in the outlying districts. Immense tracts have been cut up into residence sites by local concerns and the entire district paved with standard asphalt or bithulithic. In many instances hardly a house has been built in the tract to date, yet the permanent pavement is there and there to stay.

The writer, for the information of your Honorable Board, quotes the present mileage of permanent pavements in various cities on the Coast, and begs to call particular attention to the comparison with Oakland's present status.

Los Angeles, 65 miles of permanent pavements.

	Seattle. Miles.	Portland. Miles.	Oakland. Miles.
Standard asphalt	69.24	14.97	*15.43
Vitrified brick	11.42	1.	....
Stone block	7.62	5.51	....
Wood block	.14	1.95	.7
Bithulithic	....	20.58	....
Hassam	....	.56	....
Bituminous macadam	....	.15	....
Asphalt macadam	....	....	.12
Totals	88.42	44.72	16.25

* Including bitumen pavements.

In conclusion the writer feels that the subject of street improvements in Oakland would be very incomplete without mention of the crying need of permanent pavements in that district lying between Seventh street and the water front. This section is badly in need of immediate attention. Here are located warehouses, factories, lumber yards and mercantile concerns, representing large industrial interests, all of which operate heavy traffic.

Seattle, Tacoma, Portland, San Francisco, Los Angeles, San Diego, and every other city of importance on the Coast, have paid particular attention to the heavy traffic sections and, in consequence, only high-grade pavements are to be found in their warehouse and mercantile districts. No such condition as now exists in Oakland can be found in any of the cities mentioned. As a remedy the writer suggests an immediate policy of street improvement by large area districts. The other important points mentioned in this report, and by the adoption of which our city can profit, should also be pushed forward in a diligent and determined manner, and the writer feels that your Honorable Board in its broad policy of civic advancement will so recommend to the Honorable City Council for adoption many of the features covered herein.

* * *

A House of Many Materials

A dwelling house which is in some respects unlike any other ever constructed in this country, if not in the world, is located in the city of Memphis, Tenn. It is a two-story structure with heavy projecting cornice and dormer windows, and has the lower story built of stone in blocks and chips collected by the owner in every State in the Union and in many foreign countries. In its walls are pieces of rare marble from Greece and Italy, sandstone from Norway, onyx from Mexico and odd specimens from Australia, Ceylon, Egypt and other distant lands.

These materials, which are set in cement reinforced with steel rods, include many examples of gold-bearing quartz, ores of silver, copper and iron, together with curious bits of jasper, sardonyx and basalt.

It is stated that the walls contain more than 50,000 separate pieces, and the effect produced by the play of the rays of the sun upon them is both novel and brilliant.

* * *

He Was an Expert

The householder smothered his wrath and descended to the basement. "Are you the plumber?" he asked of the grimy-looking individual who was tinkering with the pipes in the cellar.

"Yes, guv'nor," answered the man.

"Been long in the trade?"

"'Bout a year, guv'nor."

"Ever make mistakes?"

"Bless yer, no, guv'nor."

"Oh, then, I suppose its all right. I imagined you had connected up the wrong pipes, for the chandelier in the drawing-room is spraying like a fountain, and the bathroom tap's on fire!"—Weekly Telegraph.

* * *

Learned it by Ear

The dear little girl then arose, bowed and recited it in this manner:

"Lettuce Denby up N. Dewing,
Widow Hartford N. E. Fate;
Still H. E. Ving, still per Sue Wing,
Learn to label Aunty Waite."

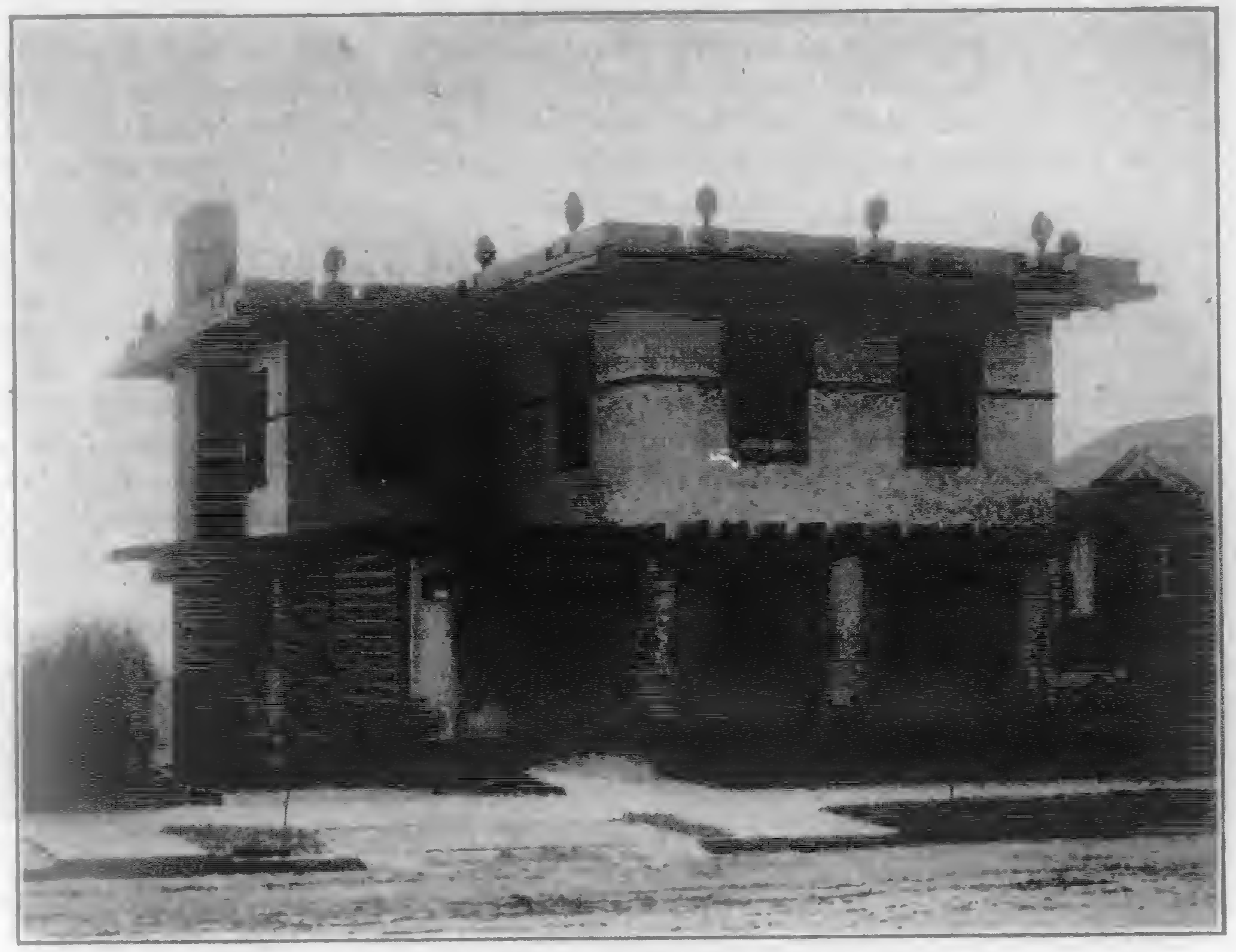
Then, with the tumultous applause of the audience ringing in her ears, she sat down in happy confusion.—Chicago Tribune.

* * *

Fulfilling Instructions

The managing editor wheeled his chair around and pushed a button in the wall. The person wanted entered. "Here," said the editor, "are a number of directions from outsiders as to the best way to run a newspaper. See that they are all carried out."

And the office boy, gathering them all into a large waste basket, did so.—The Green Bug.



House for Mr. E. C. Eccleston, Piedmont, Cal.
W. L. Woollett, Architect

Structural Steel, Standing 12 Years, Shows no Deterioration

ENGINEERS and architects the country over, says the Pittsburgh Gazette-Times, took a lively interest in the dismantling of the Murtland Building at Smithfield street and Sixth avenue, which was torn down recently to make room for Pittsburgh's largest office building.

The building was only twelve years old, yet it was one of the first steel frame structures in the country to be dismantled, and furnished the experts in that kind of construction a chance to prove that their theories regarding the durability of steel have been correct. For the steel in the Murtland Building showed no signs of deterioration; the material was in just as good condition when uncovered to the elements as it was when it was erected twelve years ago. The rivets were tight and even the grillage upon which the beam columns rested, and which was under the ground, was in perfect order.

The Murtland Building structural steel has been sold to a corporation in a West Virginia town, which will re-construct it, and about it will be another office building that will probably be standing when this generation is dead. The dismantled structure was eight stories high, with a basement, the ground area being 20x60 feet. The amount of structural steel in the building was about 150 tons.

Pat—An' what is a chafin'-dish?

Mike—Whisht! It's a fryin'-pan that's got into society.—Boston Transcript.



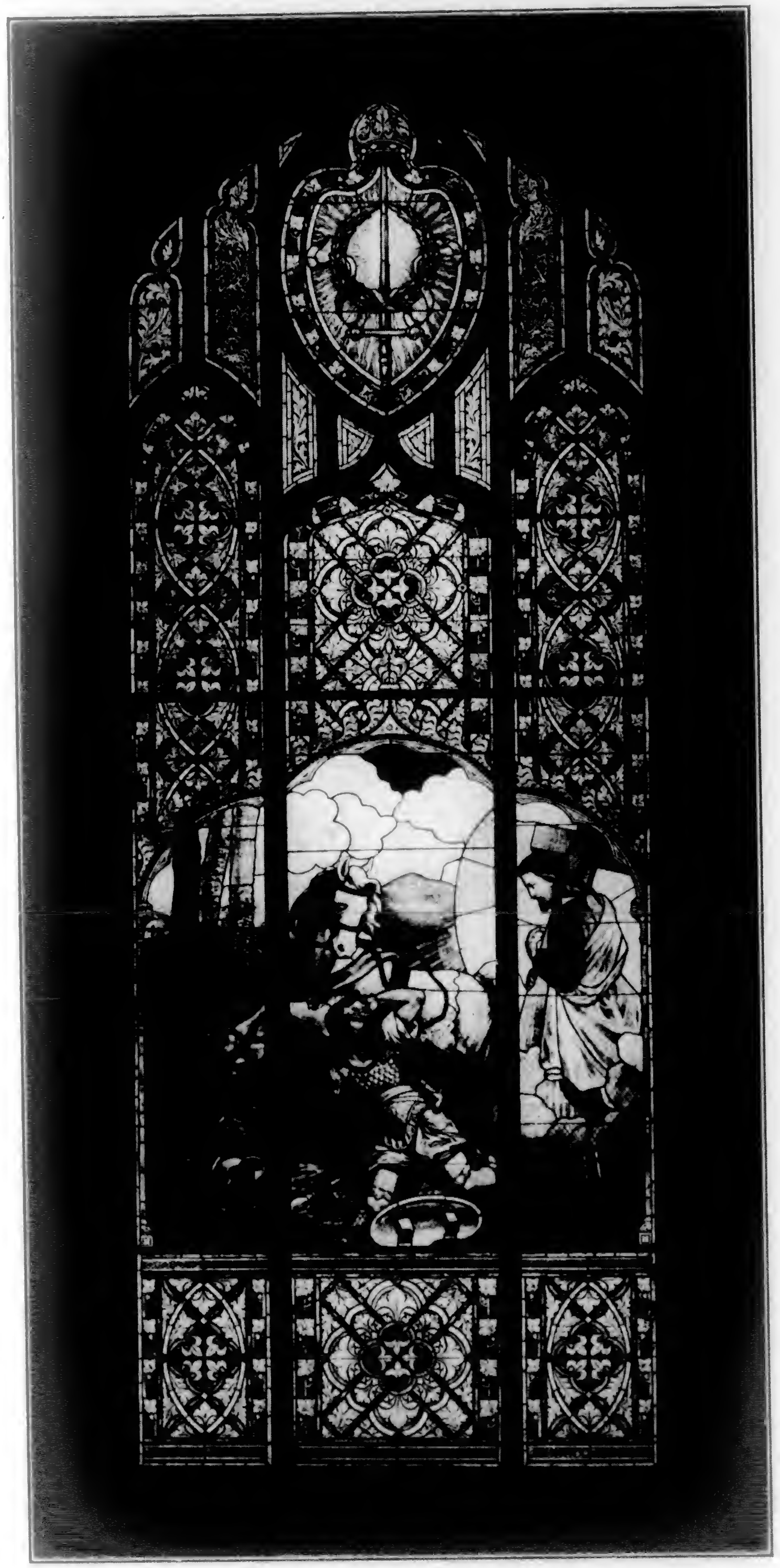
Playing a Game of Baseball by Artificial Illumination at Cincinnati

Baseball at Night

THE possibilities of modern illumination are shown in the above illustration. The photograph was taken without the usual flashlight during the progress of a game of ball on an illuminated diamond in Cincinnati. The method of illumination is by the use of huge projectors, fourteen of which were used for the purpose, although it is stated that three of them were nearly sufficient to light the grounds. The lamps are of mammoth size, the carbons being one and three-eighths inches in diameter. Alternating current of 235 volts is used. Two of the projectors are mounted behind each fielder on steel towers 100 feet high, while others are mounted on the roof of the grandstand and the covered bleachers. The lamps and installation were designed by Mr. George F. Cahill.

This marks another epoch in the enormous advancement of recreation made possible at night by the use of modern illumination. What the end will be in this direction is hard to predict. Horse racing by night would be a simple problem, and, in fact, has already been tried. Perhaps some of those afflicted with the disease called "golf" may find a way of turning illumination to account so that they will not be obliged to lose the half of the twenty-four hours in which they are not favored with sunlight. It is not impossible that artificial lighting might add some unique and fascinating elements to the game.

A boat race, in which the crews were followed by the "spot" of a powerful searchlight, thus making their relative positions visible to spectators miles away, is another dream that may yet come to pass.



"The Conversion of St. Paul," Art Glass Window in St. Mary's Church, San Francisco



St. Patrick, Apostle of Ireland



St. Columbkill, Apostle of Scotland

Memorial Windows in St. Mary's Church

WITH the restoration of St. Mary's Church in San Francisco has come donations of memorial windows from members of the parish, and several of these windows have recently been installed by the California Art Glass Works. They are splendid examples of ecclesiastical stained glass work and reflect credit upon designer and maker. One of the most beautiful windows is "The Conversion of St. Paul," donated by Mr. Francis J. Sullivan in memory of his father, John Sullivan. It occupies the west side of the sanctuary, while directly opposite is "St. Paul Preaching to the Athenians," the gift of Hon. James D. Phelan. Other notable windows in St. Mary's is "St. Francis Xavier, the Apostle of the Indies," A. D. 1552, donated by Mrs. Mary A. Tobin; "St. Augustine, Doctor of the Church Bishop of Hippo, A. D. 430," donated by John and Joseph Kelly in memory of Tobias J. Kelly; "St. Patrick, Apostle of Ireland," the gift of James and Katherine Shea, and "St. Columbkill, Apostle of Scotland," donated by Mrs. J. Cogan in memory of her daughters, Josie and Mary Driscoll.

It is unfortunate that the fathers found it advisable to place wire netting or screen on the outside of the windows, as the shadows thrown upon the glass by the sun's rays destroy much of the beauty of the exquisitely designed figures.

All the windows in St. Mary's were executed by the California Art Glass Company, the oldest institution of the kind in San Francisco, its President, William Schroeder, being a veteran in the business. The company was established in 1879 and, although it lost everything in the



"The Conversion of St. Paul," Art Glass Window in St. Mary's Church, San Francisco



St. Patrick, Apostle of Ireland



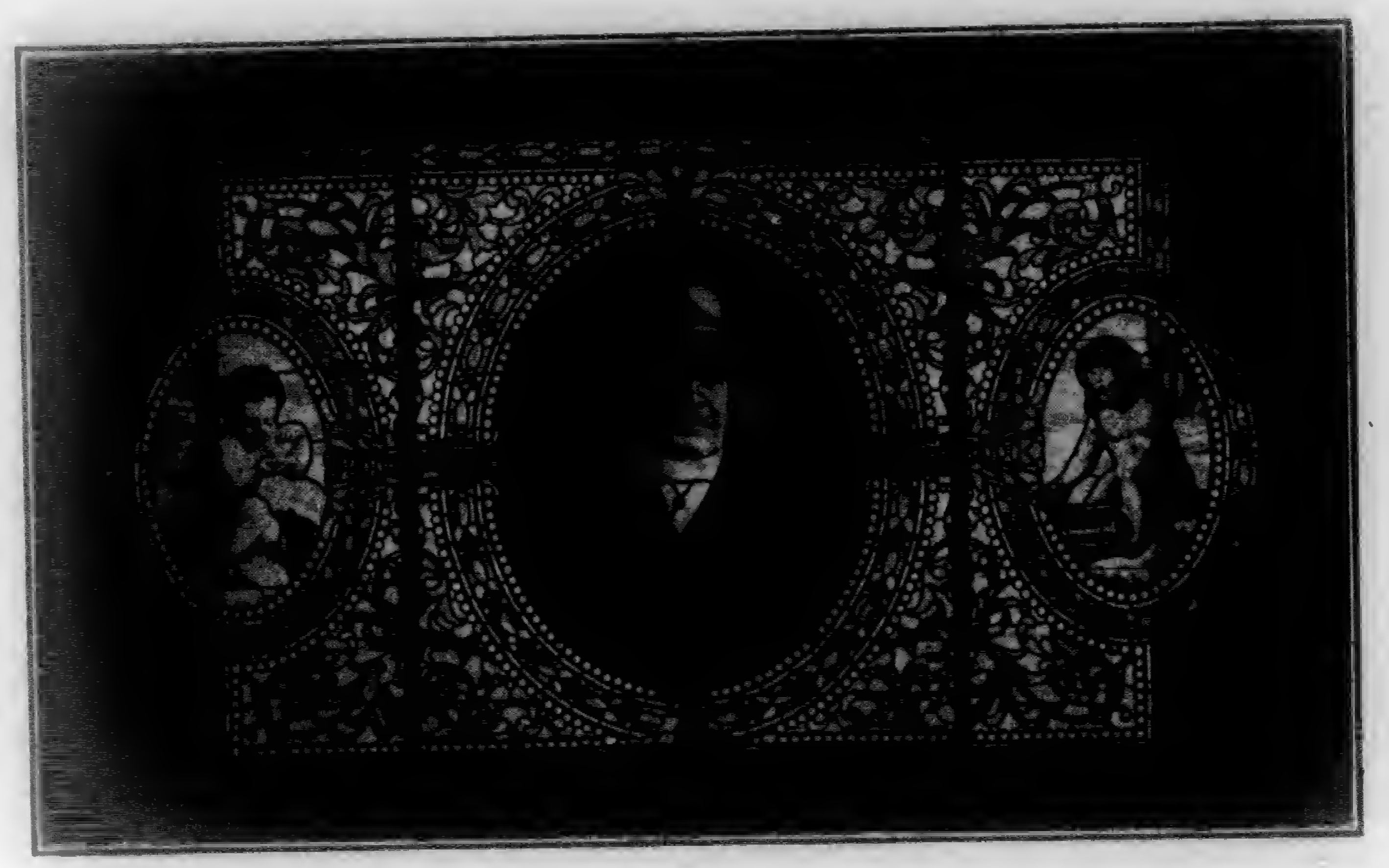
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Art Glass Panel of Colonel Andrews, Diamond Palace, San Francisco

great fire it was the first art glass concern to resume business following the disaster. The fire occurred in April; in June the company moved into a temporary building at 938 Howard street, which structure has since served as studio and workshop. Although of generous dimensions the steady increase in business brought an urgent demand for more room, and the leasing of the present commodious quarters at 768 Mission street, between Third and Fourth, was found necessary. The company is now in a better position to turn out high-grade glass work than at any time since the fire.

The art glass window of Colonel Andrews of the Diamond Palace, shown on this page, was executed by Mr. Schroeder's company, and is an exquisite rendering in colored glass. The portrait is taken from life, and the ornamentation work is done in the Renaissance style.

* * *

The Latest from Edison and His House

A REPORT from Orange, N. J., says that Mr. Edison has about completed the molds for his new model reinforced concrete house. The Edison first idea was a two-family house, but the new model is designed for but one family. The floor plan is 25 by 30 feet, and Mr. Edison thinks it can be built for $1,200 if a large number are built at the same time.

A complete set of molds will cost approximately $25,000, while the necessary plant will cost approximately $15,000 more. It will be necessary for successful operation to work with at least six sets of molds, to keep the men and the machinery going.

Mr. Edison thinks it will be possible to erect the molds for a house in four days, fill the molds with the liquid concrete in six hours and dismantle in about four days more. Allowing six days between for hardening of the concrete will give fourteen days for a house, and in this way he figures that 144 houses can be built in one year with the six sets of molds.

Will Terra Cotta Replace Wood?

THE approaching world's timber famine is beginning to worry constructors, and will mean that if afforestation is not taken in hand immediately other materials must be found to take the place of wood. The United States Government has established laboratories at various centers for the purpose of testing all sorts of structural materials. The results of these tests are published from time to time, and in this way architects, engineers and contractors are informed as to the capabilities of the materials.

Only within the last year or two has general interest in the diminishing timber supply been aroused, and to that condition may be traced also the invention of novel building materials.

Thus there is a constant attempt to employ for building the only substance of which the supply is unlimited, the soil of the earth itself. Especially is this so in and near the big cities, where the scarcity of timber and the consequent high prices are felt most seriously. For here the difference in price between a frame house and a house of more solid material is so small as to be unimportant.

Illustrative of the general tendency to find substitutes for wood is the suggestion of Herbert M. Wilson, of the United States Geological Survey, that scientific investigations into the properties of clay be undertaken. The American Ceramic Society made a start in this direction by appointing a special committee to report upon a plan "for systematizing the study of clay products."

Individual builders meanwhile have gone ahead and demonstrated the practicability of their ideas. Last year the building departments of New York City, for the first time in its history, received plans for a terra cotta house. The plans were passed upon favorably, and the house, which belongs to a professor in New York University, has just been completed.

In the suburbs around New York, there have been put up recently several terra cotta dwellings. The principal element in them is the hollow tile block.

In the walls and partitions the blocks are set on side, so that the hollow spaces form continuous horizontal pipes. These hollow spaces make the walls non-conductors of heat, and thus tend to keep the house warm in winter and cool in summer. In the floors the blocks are laid between beams of steel or reinforced concrete. With both walls and floors made of terra cotta each room is enclosed with fireproof material, and fire could not easily spread from one room to another.

The exterior surface of a house of this type is covered with a stucco of whatever color the owner chooses. The original cost of a terra cotta house is perhaps 10 per cent greater than that of a timber building of similar size. The ultimate saving is effected through smaller maintenance charges and insurance premiums.

Perhaps the most significant single effort toward the substitution of other materials for wood is the proposal to extend the fire limits of New York to include the whole greater city. If the Aldermen pass such an ordinance it will mean that no more timber houses of any kind may be built in the metropolis. Ten years ago this plan would have had no chance of success; now it has a good chance, simply because the high price of timber has made the cost of a fireproof house relatively small, and has, therefore, removed or weakened the desire of builders to use wood.

In Australia, says Building, the use of terra cotta is manifested by

the Government and a number of leading architects specifying the material for floors and such buildings as in the New Central Railway Station, the Fisher Library, the National Library, etc., as well as the internal walls of such skyscrapers as the Commercial Travelers' Club building, the Blashki building, Beulah Residental Flats, the Union Bank and other important structures.

After more than thirty years' continual use, terra cotta is still one of the standards by which fireproof excellence in construction is reckoned; in fact, being composed of clay which has been burnt in a kiln at a temperature of from 2,000 to 2,500 degrees Fahrenheit; it is actually a fire product, hence cannot be destroyed by the element that created it.

The world's timber devastation is making our constructors seek a substitute, and the question now engaging the general attention is: Will it be replaced by terra cotta?

* * *

Concrete and the Insurance Expert

From Cement Age.

THE opinion of the insurance expert concerning the fire-proof properties of concrete is a matter of great interest to the manufacturer and user of cement. Whether the opinion be for or against concrete, it is important to note the views of those who have made a special study of the subject. In the April number of the Architect and Engineer, the leading architectural journal on the Pacific slope, the conclusions of an insurance expert, Mr. T. J. A. Tiedemann, are quoted. In a recent address before the Pacific Coast underwriters, in which he discussed "Building Construction and Rates," Mr. Tiedemann expressed the conviction that brick is superior to all other materials in its resistance to fire. His conclusions were based upon observations made after the San Francisco fire. Among the materials described by him as wholly unsatisfactory are granite, limestone, sandstone, marble, and hollow tile when not reinforced. On the subject of brick he says that "pressed brick and common brick walls in which cement mortar was used, i. e., honest brickwork, proved conclusively that as a fire-resisting material it is superior to the various kinds of stone, and the only reliable barrier to check the spread of flames." The writer accords concrete fair treatment, however, in the statement that "of reinforced concrete buildings we did not have any in the fire zone," and that "therefore an opinion based upon experience in this conflagration cannot be formed as to the fire-resisting qualities of this class of structure." But, in making the very sensible suggestion that it is high time to revise the rating schedule for various mercantile buildings, Mr. Tiedemann grades materials in the order of their merit as follows: Brick, reinforced concrete, sandstone, marble, No. 1 granite, limestone, No. 2 Granite. Thus concrete ranks second in his estimation. Brick, however, is his first choice, and even in the matter of foundations he believes brick to be on a par with concrete.

A foundation wall is described as having laid forty years in ground constantly wet, remaining so solid as to resist ordinary tools and earthquake. The bricks were laid in cement mortar. Therefore, in the light of his experience and observation, it is difficult to see how Mr. Tiedemann can ascribe superior fire-resisting properties or more enduring qualities to brick, when in the practical examples of severe tests under fire, earthquake and time described by him, the integrity of the various structures depended chiefly upon the cement mortar. It seems to us entirely fair to present the proposition in this fashion:

Cement mortar and bricks properly combined in a wall may offer equal resistance to fire, earthquake and time.

Brick walls will fall under all of these tests without good cement mortar.

Cement in the form of concrete may be used without bricks.

In brief, the brick in modern construction may be dispensed with altogether.

Cement is absolutely essential in fireproof construction, whether used as a binder for brick or stone or in the form of concrete.

Bricks we may use.

Cement we must use.

It so happens that Mr. Tiedemann is quoted on another page in the same magazine, from which we extract the following paragraph:

"A potent factor in increasing the extent of, and damage done by, fires in the United Staes, is the existence of such a large per cent of defectively constructed and non-fire-resisting roofs. That the rapid spread of the fire in San Francisco in April, 1906, was due in a great measure to this cause I do not hesitate to say. On that occasion I crossed each day from Alameda to San Francisco, and being inside the fire zone I had every opportunity of watching the progress of the flames, and making such mental and written notes as I desired. In the cases of the brick buildings with inferior roofs and unprotected skylights the structures seemed to suddenly collapse and melt out of existence, as it were, apparently before the onrushing flames had attacked them. Explanation of this is that the roofs had taken fire from falling burning brands, or the terrific heat, and in this manner became furnaces within their walls, and were thus practically destroyed before the fire itself actually reached them. I recall a similar experience in Seattle, when, from different points of vantage on Third avenue, I watched the destruction of the business portion of that city in 1889. In this conflagration it seemed as if the brick buildings were demolished in less time than were the frame structures. With this, and the later experience in the San Francisco fire, as examples of the hazards of buildings with inferior roofs, unprotected skylights, etc., it should behoove us to use our utmost endeavors to prohibit for all time the construction of such roofs, particularly in San Francisco, where such a golden opportunity exists for restoring the city with buildings of modern type and fire-resisting qualities."

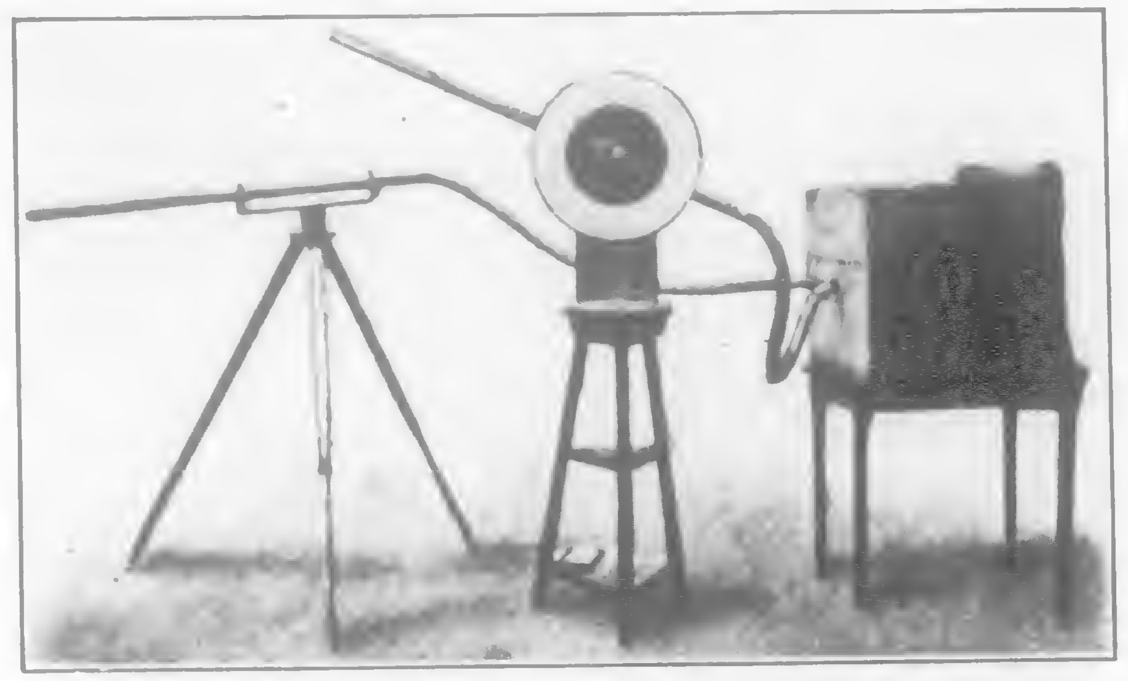
The paragraph quoted may at first glance appear to be a flat contradiction of the conclusions previously presented, but Mr. Tiedemann would probably tell us, and with good reason, that the quick collapse of these brick buildings was only a further illustration of how essential it is to use only first-class mortar. That would be about the only position he could take to make his entire theory consistent, and thus further emphasis is given to the importance of cement in fire-proof construction. Mr. Tiedemann's views are not discussed in a spirit of antagonism or even criticism, but with the conviction that they really present a strong argument in favor of cement. In conclusion it should be said that he has called attention to an exceedingly important matter in urging a readjustment of rates, and it is to be hoped that his good advice on that point will be heeded in every section of the country. His suggestions as to fire-proof roofs and protected openings are equally sound and timely.



The Yokohama Specie Bank, Ltd., San Francisco
W. L. Woollett, Architect
R. Ringrose, Builder.



Banking Room, Yokohama Specie Bank, Ltd.
W. L. Woollett, Architect



Lyon's Small Apparatus for Ascertaining the Position of Acoustic Reflecting Points

Method of Correcting Faulty Acoustic Properties of Public Halls*

M. GUSTAVE LYON, who is at the head of the well-known Pleyel piano manufacturing firm of Paris, has devised a method for remedying the faulty acoustic properties of public halls. One of the largest and at the same time the worst public hall in the French capital is that of the Trocadero, which seats 5,000 persons. By Lyon's method he succeeded in correcting the surfaces to such an extent that about 90 per cent of the disturbances are suppressed. He divides the stage into a number of ruled squares, each about five feet square. Standing on one of them he makes a loud sound by clapping two pieces of wood together. Auditors are placed in various seats, and when one of them hears the first sound and then a second one or echo reflected by the walls he raises a large numbered cardboard from which his number is noted. From each point of the stage in turn we thus make a note of the seat numbers.

Taking a given case where stage square No. 8 causes the echo in seat No. 25, we must find what points on the wall surfaces reflect the echo. This is done by drawing a line on the plan from the stage to the seat, and then from the middle point of the line a perpendicular to any wall surface P of known curvature. From this point as a base we can geometrically locate the spot on the wall which throws the echo to seat 25.

Referring to the diagram, we draw a line from point 8 on the stage to the seat No. 25, on the longitudinal cross-section of the building, which gives the line A B. We bisect this line and obtain point M. From M we draw a perpendicular to any of the large wall surfaces such as the surface P, and thus obtain the point O. We draw the lines A O, O B, which form the angle A O B, and then bisect this angle by the line O N. This line intersects the line A B at the point N. From N we draw another perpendicular to the reflecting surface at the point R and draw the lines A R, R B, when it is found for practical purposes that the point R is the one which throws the echo, inasmuch as the angle A R N nearly equals N R B. A closer approximation can be made by repeating the same operation, bisecting the angle A R B and finding thus a third point N^1 on the line A B, etc. Many of the points fall where they could produce no echo for a given surface, while others are too near to give an

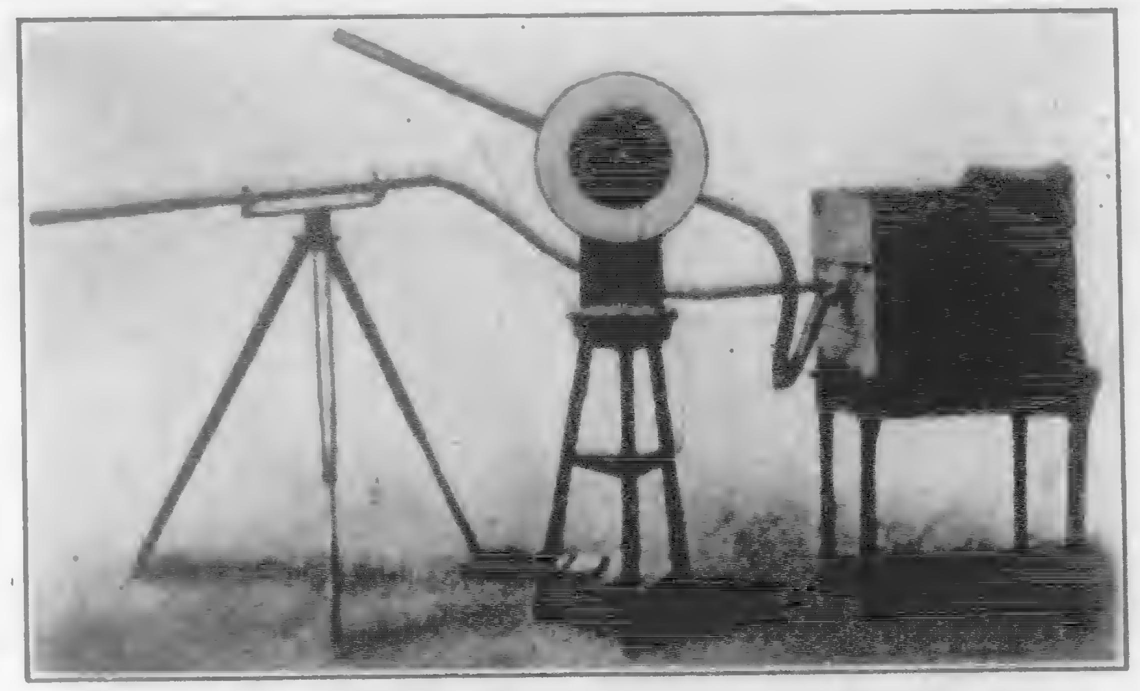
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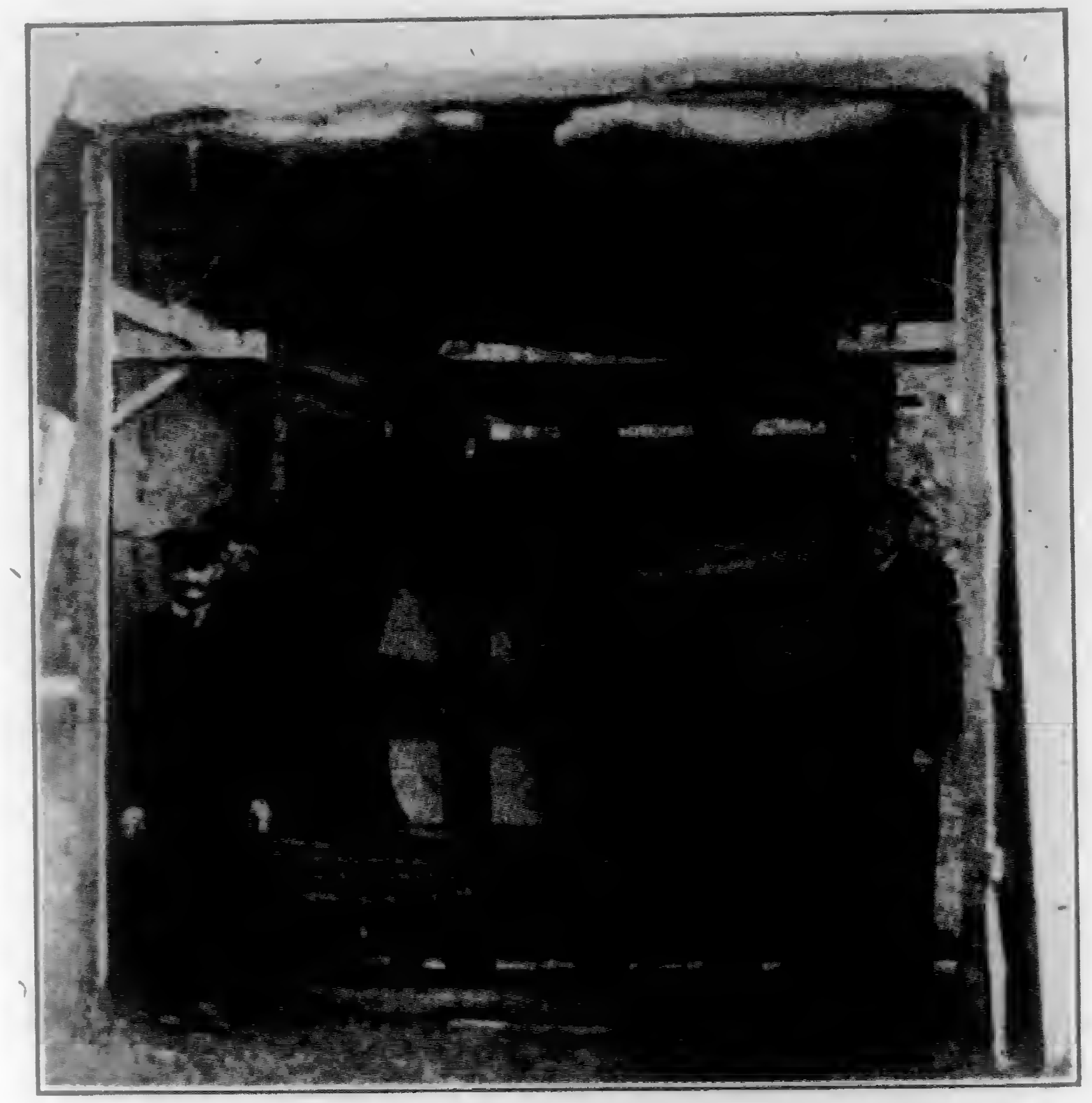
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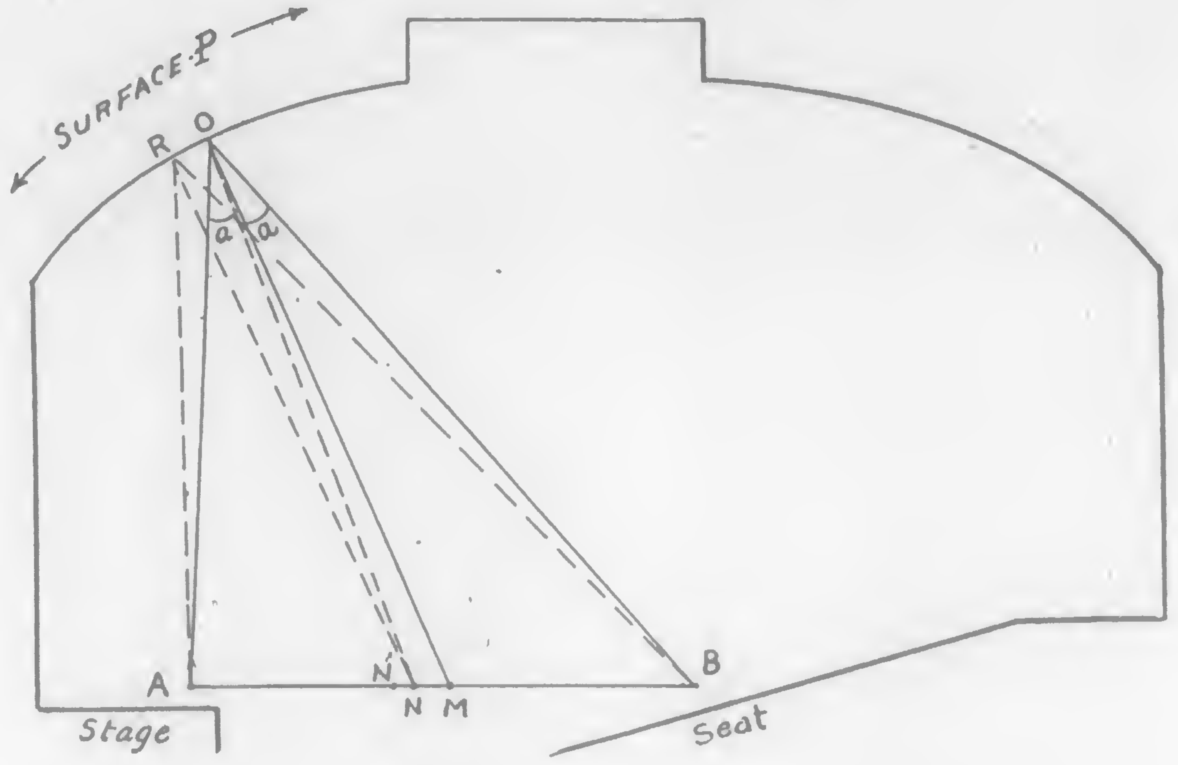


A Cloth Screen with a Sound-Reflecting Mirror Behind It

echo. An interval of one-tenth second is needed for the ear to perceive the echo after the direct sound; and as sound travels at about 1,000 feet per second, the sound must travel at least 100 feet in order to be heard one-tenth second afterward. Otherwise the direct and reflected sounds will be confounded with each other. Thus the wall point must be one-half of 100, or 50 feet off in order to give an echo, and all points under this value can be discarded.

After plotting on the elevation and plan views of the hall the points which give the reflections as we have just seen and finding the faulty surfaces, it is desired to check up these results by an experimental method, and for this purpose M. Lyon devised a novel acoustic apparatus. It consists of a long metal tube, which serves the purpose of a speaking trumpet, and the tube is connected by a rubber hose with a box about two feet cube in which an audible signal can be produced. Such a sound is sent from the tube and is projected along one general direction. For giving the adjustment and measuring the angles of the tube there is used a graduated dial around which a pointer travels mounted on the tube shaft. The whole device is mounted on a circular base. This can be turned around on a pivot after the manner of a surveying instrument.

As we know the position of any of the noted points on the wall on the vertical and horizontal plans of the building, it is an easy manner to calculate the position for setting the angles of the "acoustic theodolite" so as to direct the tube to this particular point. Finding thus from the drawings the angles needed, for the point number 32, for instance, we direct the tube to this point by the two graduated scales, and then find whether this is actually the point which gave the echo at say seat number 25, from the square number 8 of the stage. We have only to make the acoustic signal in the box which is mounted on the stage at the

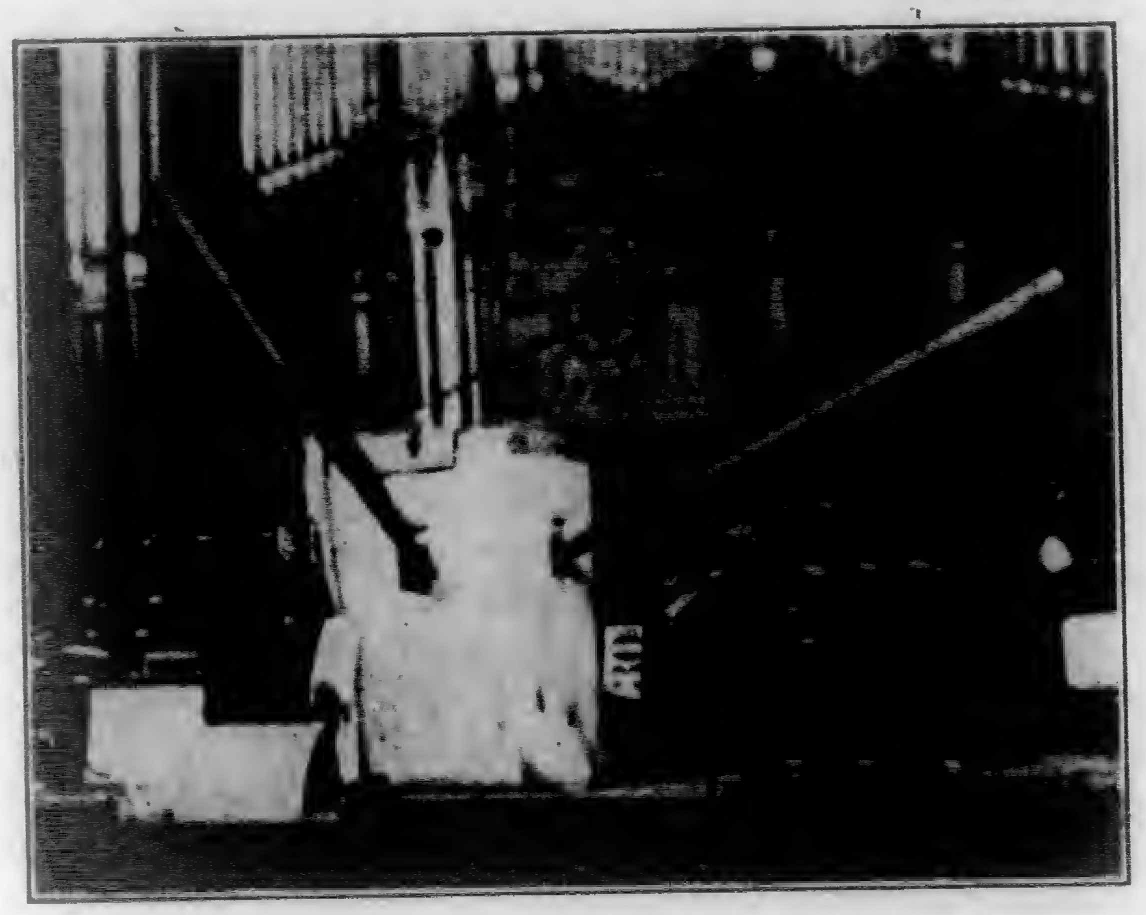


How the Reflecting Spot on the Wall Is Found

proper square, and the hearer finds whether the echo is noted at this seat. By carrying out a series of observations in this way we are able to find the exact points, and in consequence the wall surfaces which need to be corrected.

M. Lyon devised another instrument of a larger size, which is intended to demonstrate his method in a more striking manner. A small cabin is used which is sound-proof, and made so as just to cover one of the squares of the stage. On the sides are openings through which can be inserted two acoustic tubes of large size, as will be noticed. The operator is stationed inside the box. The sound is produced between the two ends of the tubes so that it is given out from each tube. Above the cabin is a support which carries a graduated beam. This holds the tubes at a given angle by wires with which the tubes are hung from the ends of the beam. Previous to this we have already located the points by the "acoustic theodolite" and noted the place of each one by referring to certain details of the ornamentation of the walls. Accordingly we are able to direct one of the present tubes, the rear one, to the same point by means of crosswires placed at each end of the tube by sighting from the inside of the cabin. In the same way the front tube is directed to the seat in question. Were the front tube to be used alone, the hearer in the seat could perceive only the principal sound given by the operator, but when the rear tube is used he hears first the principal sound and then the reflected sound. Should the front tube be stopped off he will hear only the reflected sound. Placing an auditor in the President's box, for instance, we find that the concave part of the wall lying over the organ is the principal cause of the echoes in the hall, and we can explore this region and the other walls so as to make this evident. According to the data which he thus obtained, M. Lyon was able to demonstrate very clearly that 90 per cent of the echoes of the Trocadero hall were produced by this concave surface, and that if it were properly corrected the hall would have its acoustic properties radically changed. This was, in fact, the case.

It was thought advisable to cover the wall with cloth or similar covering so as to deaden the echo. In order to find out how to do this, M. Lyon made experiments with a large circular reflecting mirror. The reflector is made of stucco, which gives a very smooth surface. It has



Lyon's Large Apparatus Employed in Correcting the Acoustics of the "Trocadero"

about 200 feet radius. In the middle is mounted a sighting tube for directing the reflector. At the proper distance in front of the mirror is a closed cabin having a small front window of two feet square, and by making a sound by striking on a suspended steel bar with an electric tapper with the bar placed well back of the window, we send out the sound on a general straight line. It falls on the mirror, being reflected from it to a point lying close to the cabin. There are three hearers placed at this point. When the operator makes the signal in the cabin it is perceived by the hearers directly, and afterward there comes a second sound reflected from the mirror, this being also a strong sound. What is desired is to suspend some kind of screen before the reflector (representing the wall), so as to shut off the sound. Various screens were tried, and one which is seen here is made of crossed strips of cloth. This cut down 50 per cent of the echo, but strange to say a full cloth covering scarcely cut down the echo at all. On the other hand, it was found that a double cloth with a few inches space between the two would almost completely suppress the reflected sound. We no doubt have interference phenomena which are not as yet very clear, but the practical effect is certain.

Accordingly, such a double cloth covering was placed over the concave surface of the Trocadero wall above the organ, this being simply hung between two flat pieces of wood strip, leaving a space of a few inches between the two cloths. A fabric of the nature of Canton flannel is found to be best. A very small expense is needed for this work, and in the present case it did not exceed $5,000. At the same time the result is striking, and the acoustic properties of the Trocadero are vastly improved, as 90 per cent of the echoes have disappeared.

M. Lyon, who had carried out all work at his own expense, was congratulated for his results by the Secretary of Beaux Arts and other officials who were present at the tests.

* * *

"A man learns to do by doing," remarked the moralizer. "Yes," rejoined the demoralizer, "and also by being done."—Chicago Daily News.

Rough Face Bricks for Architectural Beauty

(By a Brickmaker.)

AT ONE time the wave of dry pressed products swept over the country, and with the variety of color there was given the architect a mechanically perfect block of burned clay, and we regret to say that many architects made use of it, to the architectural elimination of the mortar joint, which is an important feature of any brick wall. Bricks are bricks and must be laid in mortar; therefore, if a truthful brick wall is to be built, the mortar joint should be a part of it. We fear that there is a present tendency to go to the other extreme and consider mortar as the building material, in which bricks are to be laid.

There are extremists in everything and perhaps they add something to the betterment and beauty of the world. We do not know. But somehow we cannot help saying "amen" to the wish that some of the architectural freaks had died in infancy.

We not only gave the architect a great variety of colors, but we gave him variation in size. To the Standards we added "Romans" and "Normans." The colors, the several sizes, together with the possibility of different bonds, gave the architect opportunities he had never known before.

Our cities, architecturally, took on a new light and life and color of which we had never dreamed.

We did our part toward a more beautiful city and the architect his, but the brickmaker and the architect alike failed to consider the most essential element in building architecture, the effect of time, the problem of "growing old beautifully."

Is this a lost art in architecture? Did the ancients understand how to build for all time? They lived longer than we do and had better opportunity to study the effect of time. Or was it because their materials were nearer nature than ours—everything hand-made? We can not say, but we know that our beautiful buildings became streaked with dirt and hideous in a decade. It was no longer a question of "undertones of pink" but of the original surface color.

The manufacturers of light colors began to mottle the bricks—"mottled," "speckled," "iron-spot," etc., to break up the color and in an effort to make the bricks dirtproof. It was about this time that the influence of stiff-mud bricks began to be felt in the market. Also enameled bricks were under serious consideration by many manufacturers, but architects would not have enameled bricks as a general facing material.

The demand for a material which would not show dirt became insistent. There was a notable adoption of darker colors and rougher shades, and paving-brick became a feature in the market. The latter certainly does not show dirt, and aside from that, surely deserves a place in our building scheme, but it could not fill the place of the brighter colors.

There was an attempt by the dry press brick manufacturers to introduce rock-faced bricks, but it failed because the architects would have nothing of it. It was a noble building material debased into an imitation of another noble building material. Possibly a more extended use of rock-faced bricks would have led us sooner to recognize the merits of rough-faced products.

Texture is wherein we have failed to meet the requirements of the architects, and texture is a very important element. Why put burlap on our walls? As well use a smooth paper printed to imitate burlap.

A printed or painted cloth on the floor would soon hide its color and design in dirt, while a rough-coated tapestry will hold the design and color to the last rag, and if it be a Persian rag will still command a high price in America. It is the tapestry idea that we need in brick—not the color effect, but the texture.

We have heard the cry of "fad" against the rough effects that are now coming out, but they are not fads. They have come to stay and multiply.

What we are after are effects of light and shadow, and not visible roughness—at least not visible at the distance from which the wall is viewed. We wish to break up the smooth, brilliant colored surface and give softness, and in doing this we bring out the depth of the color and its true life by the contrast of light on the high points and shadows in the depressions. Quoting from a German article: "Smoothness in brick surfaces eliminates the play of the light and shadows which is essential to the enlivenment of the surface, and prevents softening of the too strong colors on the one hand and the animation of the gloomy on the other hand." If manufacturers will keep this in mind there will be produced fewer of those freak products, whose only excuse for existence is that of roughness. Such rough effects, whose only merit is roughness, may please us for today, and we bear with them tomorrow, but on the third day we would relegate them to the ash heap if we could.

The wire-cut face brick—we mean a stiff-mud brick with a wire-cut face—has developed wonderfully in this country, and a number of factories are making it almost exclusively. The same brick is being experimented upon in Germany, but with no marked success up to the present time.

The wire-cut face is especially pleasing. There is nothing mechanical about it. The wire dragging through the clay roughens up the surface in a series of ragged corrugations, and no two bricks have the same light and shadow effect. At first a great deal was said about the dirt that such a surface would accumulate. The product has been on the market about six years, and the first buildings constructed show no evidence of getting dirty, and it is believed the bricks will hold their color-effect longer than a smooth face brick. The softening and blending effect of time which should enhance the beauty of the wall, will deal kindly with this product.

We have given the architect color and form, and now give him texture in any degree, subject to his orders—a combination of qualifications which no other building material can give.

The writer recently has seen a fine display of these rough-face products at the offices of the Diamond Brick Company, 1050 Monadnock Building, San Francisco. Experts say they are among the finest and most artistic in the country.

* * *

All That Was Left

Church—Did you see the hotel fire?

Gotham—Yes.

"Totally destroyed, I suppose?"

"Everything but a few sheets of writing paper on which was printed in large letters: 'This hotel is absolutely fireproof.' "—Yonkers Statesman.

"I hardly know my wife by sight. You see, I made her acquaintance at the masked ball, and now we're traveling in our auto all the time!"—Jugend.

The Law Regulating the Practice of Architecture*

VI Permits and Bids

By ROBERT MORGENEIER, Architect and Engineer.

FOR buildings erected by and for the State, by State or General Government, no building permit from the municipality in which the building is to be located is required.

The granting of a building permit is a police regulation proceeding from the presumption that the owner must be restrained from a possible infraction of the building laws made and provided by the city, and can therefor only be lawfully issued after a showing has been made that the proposed building is not contrary to such laws.

All of these "building laws" have two points, in view, viz: first—that buildings shall be so built as not to fall down, empty or when occupied, and second—not to be a menace and become a nuisance when occupied or vacant.

Building permits are issued by "inspectors," persons supposed competent to construe plans and specifications and also construe building laws. These inspectors are not examined as to their qualifications, but must, by the fact of their rendition in office possess some knowledge of the subject, furthermore a contrary ruling by an inspector is in no case final, and ready remedy is provided by an appeal to the "Board of Public Works" or "Commissioners," and from them to a special commission of experts.

However, as loss of time and money is inevitable in every case of appeal, it is advisable to submit to all reasonable demands of inspectors.

In fact, when we get to examine the methods and proceedure of enforcement of the building ordinances of the larger California cities, as relates to issuing of building permits, we find that the construction placed on such ordinances is lax, particularly in the showing required of plans and specifications.

These showings, when made by parties not architects are, as a rule, defective and fragmentary.

The laxity in permitting such partial showing to pass is in part excusable because the ordinances themselves are not stringent enough in this particular.

There is no provision in these ordinances that plans and specifications submitted shall be prepared by, or at least attested to as proper and complete by some lawfully certificated architect.

I have dwelt upon this omission when referring to the California Statutes, "An Act to Regulate the Practice of Architecture," approved March 23, 1901, and an amendment to same, approved March 26, 1903, and here repeat that the cities are remiss in this particular duty, preferring to throw all the responsibility upon their so-called inspectors.

It is not enough to say that if there are objections these will be discovered by the inspector or remedied by him after the building is in progress. The plans themselves should show prima facie by the seal of an architect that they cover a safe, proper structure, also conforming in all respects with the city ordinances covering such structure. If the architects attest to this effect should prove grossly erroneous, he is amenable even to the extent of having his certificate canceled by the state board.

That a permit shall only issue upon complete approved plans and specifications is evidenced by the wording of the different city building laws. Typical of these is the San Francisco law which under Part III., Sections 6, 7, 8, 9, 12, 13, 335 and 336 generally provides that "no person,

*Sixth of a series of articles on "The Law Regulating the Practice of Architecture."

company or corporation shall erect a building or structure of any kind, or add to, enlarge or extend any building or structure already erected within this city and county, without first obtaining a permit from the board of public works," and that plans and specifications fully showing and describing the proposed improvement shall be submitted to such boards, "all of which, assuming the city officials to be competent, will undoubtedly tend to secure safe buildings. But are the officials all, and at all times, competent and strictly honest? In fact, can they grasp all that is understood by a thorough architect under the term "safe"? I think not.

Conceding, for argument's sake, that an inspector was competent to construe plans, specifications and its ordinances, he then only has the latter to follow as his guide, mentor and law. Now, what are the best set of city building laws as compared with the details of architectural and engineering operations carried on in a large city? At their best, they are limited to a rudimentary outline, with here and there a detail thrown in. Because of the ease of intercommunication, of advances in all the applied sciences, the perfection and widespread use of photography and the graphic arts, all that has been done architecturally from Pharaoh to our day, is spread out before us and used more or less in new constructions. What "building laws" can be devised to harness this cosmic phalanx of the arts and sciences?

Learned jurists may set down and codify the common law, and when this is completed you may then possibly pick out of it a set of rules fit to govern the constructive arts.

These same cities will not permit a quack to practice medicine, or appoint him to a position in its hospitals, etc., but they actually invite every species of architectural quackery whereby the welfare of the community is jeopardized. Waiving every consideration of the aestetic feature, important as it is, every building proposition harbors within itself the elements for future good or evil. If structurally correct in design, it may be expected to stand, an enduring monument for generations to come. If improperly designed, it may fall to the ground before the roof is over it, burying and crushing the life out of its victims, or, it may stand apparently safe and sound, and suddenly upon the yielding of one weak member the entire sham may collapse.

Considered from a hygienic standpoint, a building may be designed and equipped so that ultimately it will be a hotbed of pestilence, insidious and hardly noticeable, yet doing its deadly work year in and year out, a home for rats and other vermin, it sends its pestilence abroad.

Plague, pest and death are engendered, nursed and developed in every improperly constructed habitation of man or beast and are carried into those of better construction by a thousand and one means of transmission. All ill-arranged sewerage systems poison the inhabitants of the building which it contaminates.

A theatre or public assembly hall may have all the exits and other general features provided by ordinance, and yet have some structural defect, or defect in arrangement which may be the cause of a heart-rending catastrophy in time to come. The natural and arrtificial lighting of a building may be so contrived that it contributes to the welfare of its occupants by not robbing them of the light. Ventilation insuring an abundance of fresh air can be arranged, or drafts may chill its various rooms and foul air lay heavy in the unventilated nooks and corners. Dampness, mildew and festering age follow in the footsteps of improper foundation designs. No building ordinance can correct such abuses, no inspectors look far enough into the future to construe his ordinances so as to meet them.

There is required a keen, scienced mind, occupied only with the one subject of building construction to any measure successfully grapple with the problems that, when solved, lead toward safe construction and ideal aestetic and hygienic conditions.

For this, let municipalities attract and encourage thorough architects. There are no valid objections to the encouragement of a higher order of building construction. True, many have been or are still urged; for example, there was considerable opposition to any law regulating the practice of architecture on the ground that it was class legislation and that the architects in the field could keep out others by refusing them certificates. The record shows a different result. Nine of the ten members of the present examining board are old-time architects who never passed the state examination. Many of them have held office since the law went into effect. There are now (1909) in the State of California 451 certificated architects; of these 237 hold certificates issued because of the fact that the holders were practicing in the state at the time the law was enacted; 214 others hold certificates granted after examination, so that practically one-half of all the architects at present holding certificates were admitted by boards made up almost exclusively of non-examined old practitioners. It then appears that the act has encouraged the growth of the profession, not hindered it, for certainly a growth of 50 per cent in seven years is a sound growth.

The admission of this great number of new members is an eloquent testimonial to the unselfishness, fidelity, unquestioned honor and integrity of those who have, without material reward or compensation, devoted their valuable time to the examintions and meetings conducted by their board.

Another objection to the law was that it would tend to curtail the free exercise of artistic constructiveness, unless connected with a "college training."

The facts show that the vast majority of buildings are designed by the regular lawful architects in the state, and the minority number are put up by speculating contractors and grasping owners who care nothing for the welfare of the community at large.

Objection No. 3 dwells strongly upon the costs piled up on owners for architects' services, if all plans must be prepared by them. The fact that at present over 90 per cent of all buildings are from architects' plans shows that this "cost" is not sought to be avoided by the majority of owners, and for this they are entitled to protection from the vicious practice of a small minority, for the one reason that their good buildings are menaced and injured by the unsafe or unsanitary ones of the minority.

Finally, as an objection, a great deal of sympathy has been expressed for the "small contractor" who builds without architect's plans—yes, and in his small way disfigures whole streets by putting up here and there his repulsive creations. The one to sympathize with in such case is the owner of a really fine building suddenly beset, perhaps right and left, by such speculators' "shacks" or death-traps.

Again, and finally, even though it is said to ears as deaf as a stone, it is the duty of every city of any size in the state of California to enact "that all plans and specifications upon which building permits shall be issued must bear the seal and endorsement of a certificated architect practicing in the state."

In addition to the general permit above referred to, all large cities require the owner to take out permits for parts of proposed new buildings, to be first constructed, for enlargements and repairs, for special construc-

tions and new devices, for excavating, sewerage work, plumbing, temporary use of street, electric wiring, erection of scaffolding on or overhanging public ways or walks; also a cash deposit is required as a guarantee that walks and streets will be restored to original condition immediately building operations are closed. For all these permits forms are provided by the respective boards and fees collected by them.

Fees for Permits.

The law allows the imposition of permit fees. These are graduated and depend upon the stated cost of proposed structure. It is the architect's duty to state the true estimated cost.

A gross underestimate is considered, trickery and deception, and the architect is subject to fine and punishment if convicted thereof. Ordinary building permits expire by limitation, generally after six months, but may be renewed by again filing application and again paying the fees.

Bids and Bidders.

In principle there is no difference between a man's bid to do one day's work for a certain pay, and the bid of a contractor to erect extensive buildings. In each case the object is to have the work done right and at the lowest cost consistent therewith. Asking for bids with any other hidden purpose is a fraud practiced upon the bona fide bidder.

As a contract is to follow the submission of bids, a bid must state the bidder's terms and nothing else, also the terms must be unqualified.

Before the owner and builder can enter into a contract they must meet on these terms; they must understand each other. No building contract can be made without such understanding. Immediately, however, the terms of a bid are accepted a contract exists, and for this reason and to guard against confusion a form of regular procedure, defining regular steps leading up to and resolving into a contract have been devised and most generally adopted, the first of which steps consists in asking for bids.

Bids are naturally supposed to be competitive; if collusive, they are ipso facto void. When the work to be let is considerable or of a public character notice of bids wanted are published in the newspapers and by posting in prominent places.

The essentials of such a notice for bids on public work reads as follows, viz:—

Board of Public Works,
City of............, State of ....
................................, 1909.

Sealed proposals for the construction of a............building to be located on the west side of............street between............ avenue and..............avenue, in the city of............., county of ....are invited and will be received at the office of the....... ....located at.............., city of.............., state of...... ...., until.... o'clock...m., of the......day of (month), 1909, at which place and hour the bids will be publicly opened and read.

Information to Bidders.

All bids will be compared on the basis of the architect's estimates.

The work to commence......days after the execution of the contract and must be completed before the......day of............, 1909. A certified check equal to..........per cent of the amount of the bid must accompany such bid.

The amount of the bond required for the fulfilment of the contract will be equal to........per cent of the price bid.

The amount of the bond for the protection of material men will be equal to........per cent of the contract price.

The contract will be awarded to the lowest responsible bidder.

For general instructions, blank forms, plans and specifications, apply to ....
Per...... ...., Sec.

Innumerable forms are required for public undertakings, as each differs somewhat from the others, and as it is the practice of public officials to have these drawn up by an attorney, the complete knowledge thereof on the part of the architect is not so urgent. Should he, however, aspire to the position of city architect he should be well able to frame such documents should the emergency arise.

In extensive private undertakings the notice should read:

Notice for Bids.

The undersigned requests and will receive sealed bids for the construction of (here state style, size and kind of building), to be located (here state site), such bids to be received until........m. o'clock on the........day of ...., 1909, at which hour the bids will be publicly opened at my office located at No................street, city of................, state of..............
...................., Architect.

The work will be let to the lowest responsible bidder (or the owner reserves the right to reject any and all bids.).

For information as to certified check, bonds, general instructions, plans and specifications, apply to office as above.

A notice for bid to one contractor may read:

(Date here.)

...................., Contractor.

I am asking for bids on a wood frame, shingle roof, eight-room dwelling house to be built on............street, city, all bids to be in by.... o'clock next.......day, ..., 1909.

Plans and specifications now ready at my office.
...................., Architect.

If bids are asked for part of the work, the notice will so state.

When it is stated that the work will be let to the lowest responsible bidder, it is proper to demand a certified check in a sum generally 10 per cent of the amount of bid as a guarantee that the bidder will enter into contract if the work is awarded him, and if he declines to so contract he forfeits the amount of his check. A bank may, however, be enjoined from paying such check and the matter must then be brought into court. Where the owner reserves the right to reject any and all bids, thus serving notice that his intention is to compel the bidder to disclose his cost figure, and thereupon, if he so elects, reject it, without giving any reason or explanation, he cannot ask for a certified check or any other form of security from the bidders. If so, and a bidder would furnish security he would be exceedingly foolish, indeed.

Under "lowest responsible bidder" is understood the one whose bid, properly written, and submitted at the time specified, when opened in the manner and at the time specified is found to be the lowest in amount of dollars and cents, and further who can show, when called upon, that he can furnish the bonds required to guarantee the fulfilment of his contract; also, if he has engaged in other similar undertakings, his record therein must show that he has paid all his bills for labor and materials in full, and that his work has substantially embodied the work shown or conveyed by

plans and specifications. Private owners, and public officials as well, have the right to exercise discretion, provided this is done in good faith, in awarding a contract, if, in their judgment, for any valid reason whatsoever they decide not to award the contract to any certain bidder, the law will uphold them herein, excepting where the statutes particularly declare that the contract shall be deemed confirmed in and to the lowest bidder at the time of opening of the bids, in which case it has been held that the officials cannot exercise discretion in awarding the contract. The successful bidder need not prove his ability to personally do the work or any part of it, or to finance or superintend the undertaking. In fact, he may assign the contract to another, but in all cases he or his assignees must do the work and conduct the operations in a manner satisfactory to the owner, and provision is always made in the contract proper, to that effect.

The single proposition of every bid shall consist of a propositin dividable into three parts, viz: first, what the bidder will do; second, for whom, and third, what he asks in dollars and cents for doing as he proposes. Hence, all bids shall read:

I will build, erect and complete (here state kind of structure, etc.) for (here state name of owner and place of his residence or office address), as shown and described in the plans and specifications prepared by (name), architect, of city of..............., state of..............., for the sum of $............

(Signed) ...., Contractor.

Bona fide competition is the most important factor in letting work to bidders. Any act, tending to impair or destroy the bona fide quality of any bid is punishable under the law, when such bid is for public work.

Notice to Bidders.

After the opening and tabulation of bids, the amount of each bid shall be plainly posted, or communicated to the bidders upon application.

Certified checks or other security of unsuccessful bidders are to be returned without delay.

Bids for private work may be withdrawn at any time; not so, however, with bids for public work. The bidder in the latter case can, however, file notice that he wishes his bid canceled or not considered at an opening up of the other bids.

Of the reprehensible practice of securing a number of bona fide bids for the sole purpose of arriving at the lowest possible contract price with some favorite of an owner, nothing need be said except to condemn it in unmeasured terms.

Having taken up the allotment of space with the above matters, it will be necessary to postpone the subject of Contracts and Bonds until the next number.

* * *

He Belonged to the Union

"What happened to Rollingnan?"
"He drowned."
"And couldn't he swim?"
"He did, for eight hours; but he was a union man."—Pick-Me-Up.

Why is a one dollar bill of more value than a silver dollar? Because when you put a one dollar bill in your pocket you double it, and when you take it out you find it in-creases.

Why a Brick Building Costs More than Frame

WHEN a frame store or residence is built, the owner thinks that any man handy with a hatchet can erect it. He is usually an inexperienced man with no financial standing and the owner considers it safer to buy the material himself. The lumber bill is made out by the so-called contractor, and is bought by the owner; the extra lumber bill often amounts to more than the original figures, writes A. C. Ochs, of Springfield, Minn., in Brick.

This contractor sticks a few stones under the sides and ends of the building for a foundation; a small hole in the middle, stoned up with a few "niggerheads" serves the purpose of a cellar. Instead of using 2x14x12 inch on centers, 2x8x16 inches on centers are used for joists with a sill through the center. The front is a cheap affair; no plate glass, the cheapest kind of roof is used, and the floor is of single thickness, and of soft boards. When the owner decides to erect a brick building he thinks that such a building will cost him a great deal of money and he does not feel like saving on little things such as joists, floors, glass and basement; he wants a cement floor in his cellar and it must be drained. It is these seemingly little things that make his building so much more expensive rather than the brick construction.

The brick walls of a two-story brick building, 25x70 feet (say on an average 26 feet high), with walls 14 inches thick, figuring brick at a cost of $7.50 per M, sand costing 75 cents per yard, and lime 85 cents per barrel, all laid up with good mortar, will cost not more than $1450. This includes all labor and material, and also a pressed-brick front. Now how can you save much at the present price of lumber if you want to build these walls of lumber in a first-class manner, lath them inside and paint them with three coats of paint on the outside?

The writer has rebuilt a western town in Yellow Medicine County, Minn., which was almost totally destroyed by fire in the year 1893. The following year, 1894, he built 24 solid brick stores and a year later four or five more stores and a large school building, all of solid brick. When the writer arrived in the town the business men had practically made up their minds to rebuild of lumber and cover with galvanized iron. But the writer proved to them that brick was cheaper, although lumber cost 50 per cent less than now and brick cost $9.10 per M at the building. The insurance before the fire was from 5 to 7 per cent and after the fire it was a fraction of a cent on buildings and stock. Supposing a merchant had a building worth $4,000 and stock costing $10,000 and had it insured; he would save at least from $600 to $700 a year on insurance; besides this he could carry part of the risk, when he has a fireproof building, and at the same time be relieved of the worry incident to doing business in a fire trap.

There have been some just complaints about brick buildings as to their not being dry or warm. Now if a brick mason knows his business there is no reason why a brick building should not be as dry and warmer than a frame one. If a brick wall is laid up with a 2 or 3 inch air-space so that this air-space runs from top to bottom without any obstruction; if this wall is tied together with wire instead of brick, and is plastered air-tight from top to bottom so that it forms a dead-air space, so the air cannot leak out or circulate; and if the brickwork is well laid, the building will be as dry and warmer in winter and cooler in summer than any frame building.

Of recent years the brick manufacturers have made rapid strides toward making perfect ware for the construction of dry and warm buildings. A great improvement over the solid brick is the using of hollow brick and block in walls of residences and smaller buildings. Where hollow block are used the

4-inch outside facing should be of solid brick which should be back-plastered before the block backing is laid up against the outside facing. If a 2-inch air-space can be left between the outside facing and the 8-inch block backing, both sides of this air-space should be back-plastered, but ordinarily a 12-inch wall without air-space will do when block are used for lining, but the air-space is a great improvement even when hollow block are used. In order to get the best results with hollow brick or block, they should be very porous, with 20 to 25 per cent voids. A porous block is a non-conductor of heat and cold, whereas a dense block, like iron or granite, being a good conductor of heat and cold, will make a cold and damp building. A dense block will also crack like crockery in contact with fire and water, whereas a porous block will not.

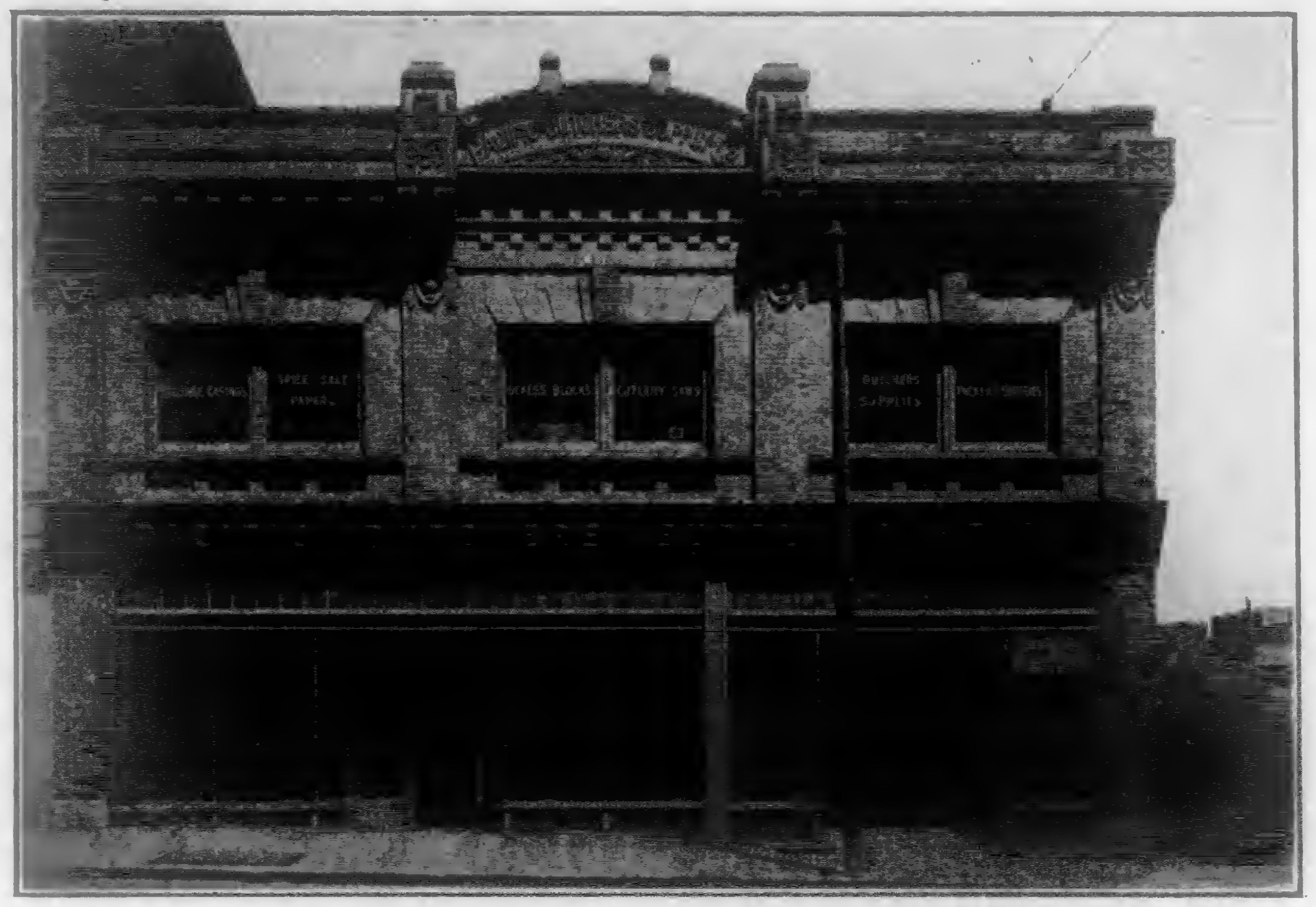
If you want a warm, dry and fireproof wall, use hard brick for the outside tier and porous blocks for the inside lining. If an air-space is built, tie the walls with wire ties and not with brick. Be sure to have all the joints well filled. If this is followed a warm and dry wall is certain.

The writer has served his apprenticeship as a bricklayer, and has built buildings exclusively from his fourteenth year until he was 45 years of age, and during all that time not a single building built by him has failed to keep dry. Three or four years ago he visited Canada and found that in Toronto, Montreal and Quebec three-fourths of the residences for all classes of people are of brick, and in some of the districts all of the farmhouses are of brick. Two years ago he visited in Cuba, and failed to see any frame buildings in Havana.

The price of lumber has so steadily increased, that thoughtful people have looked around for a substitute, and the consequence is that various kinds of building material have been put upon the market. There are blocks made of different kinds of material with two to two and one-half inch walls, and the rest is air-space. If you wish that kind of a wall, why not buy the cheapest kind of brick? Lay up two 4-inch walls with a 4-inch air-space and back-plaster them, and tie them together with wire walls-ties. This gives you a very warm wall 12 inches thick and stronger and cheaper than a cement-block wall. If you want cement finish, then you can plaster the outside of the wall with a thin coat of cement, and quarter it off so it looks like sandstone. This cement mortar can be made rich and applied in a plastic state, which will make your wall perfectly water-tight; whereas the material for cement blocks must be rammed into the forms in a semi-dry state whereby it becomes like a sponge. It will not crystallize and harden like the top coat of a cement sidewalk, which for the above reason is applied in a very soft state.

There is no doubt that it was a blessing to the bricklayers that other fireproof material was invented. This effort has had the effect of waking up the manufacturers of brick to the signs of the times. How could they expect to burn good brick in an open kiln with a 4-inch wall placed around the green bricks, and plastered with mud? Naturally with such primitive methods of burning, some of the bricks were overburned, some not burned enough, some just right, and some not at all. But all of them found the way to the market, and as many of the bricklayers have only "picked up" the trade, and know not an unburned brick from a burnt one, the result was that many of the half-burned brick were used for outside facing, and have disintegrated in the walls. But the brickmakers have opened their eyes, and the progressive ones have built up-to-date kilns, so that all their ware is well burned. Well-burned brick will last almost indefinitely in any climate and will harden with age.

History shows that clay brick is the most durable of all building material. Tablets which were made of burned clay thousands of years ago, are excavated daily in all climates, and are found to be in a good state of preservation. Can this be said of any other building material?



Building for Pacific Butchers' Supply Company, San Francisco
Chas. King & Company, Builders
Reid Bros., Architects



Apartment Flats for Mary A. Gannon, San Francisco
Chas. King & Company, Builders
Reid Bros., Architects

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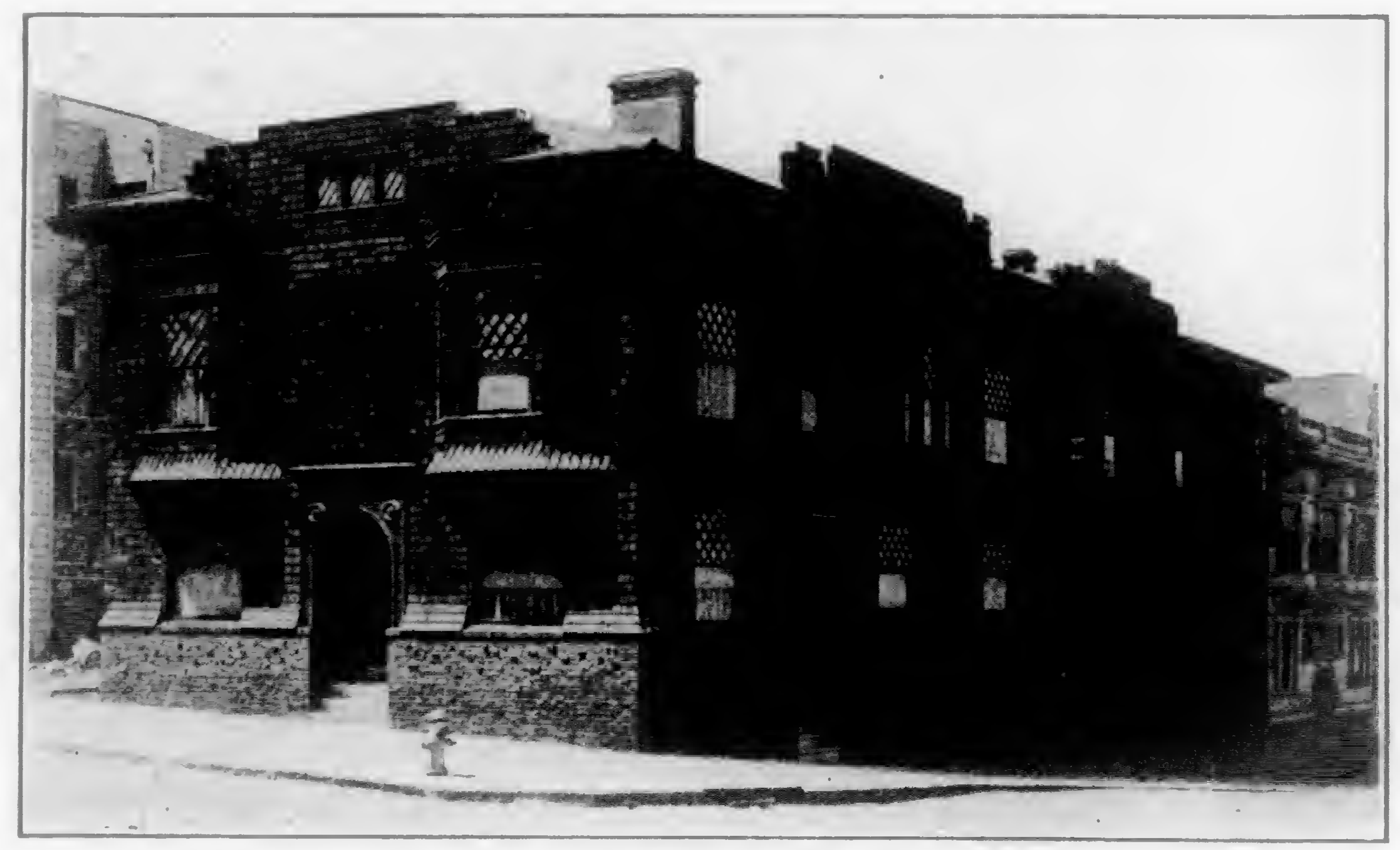
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Plastic Panel by Hugo Herb, Studio of C. Menzer & Son, San Francisco

The Department of Architecture in the University of California

By EDWIN J. SYMMES, in the California Journal of Technology

YEARS ago, when the architectural institutions of this country founded their courses in architecture, they were established as adjuncts to already existing courses in engineering. This action was taken, not merely as a matter of expediency, but was mainly due to a general misconception of what the real requirements of a successful architect are. They failed to appreciate the fact that architecture is not a phase of engineering, but one of the fine arts—one of the learned professions. The result of this sort of teaching was to give to the American student a totally inadequate training, if not a false conception, of the profession of the architect. Hence it was that most of the men trained in architecture in America rarely arose above a position as a salaried draughtsman. The real architects were trained abroad.

Gradually the schools began to realize the inadequacy of their methods of instruction, and they arose as rapidly as possible to meet the real requirements of an architectural education. A new type of training has arisen, which will in time outrival the old-world methods, or at least be more adaptable to this country's needs. It was with these realizations that the department of architecture of the University of California was organized under the present regime in the spring of 1903. At that time there were but few who sought instruction in its necessarily limited courses, but that number has steadily increased, as has also its facilities and equipment. Within a short time this department will be on the same level as larger Eastern colleges as a school of architecture.

I have said that architecture is not a phase of engineering. True it is that the technical training of an architect should be as broad as possible. He must be thoroughly familiar with the principles of construction, both graphically and analytically. He must have a correct insight into the history of architecture and of the other arts of classic, middle-age and Rennaissance periods; he should have a good general knowledge of the development of civilization in order that he may appreciate the relation of architecture and the other arts to the political and social life of those periods, and, above all he should have developed in him to the very last degree an artistic temperament, for the problems which he must grapple with are primarily esthetic problems.

In the former great periods of art, the architect was guided almost entirely by tradition. He deviated but little from certain prescribed forms—and he was not expected to. Striking examples of the influence present themselves to us in classic and Rennaissance architecture. Tradition, however, enters but little into the architecture of today, so we must seek elsewhere for a guide and corrective. There is but one thing which can fill this vacancy, and that one thing is scholarship. By scholarship I mean a clear understanding of the history of the different forms which the architect must base his design on, and of the ideal conceptions arising from these, a familiarity with the material wants and constructive conditions of his problem, a realization of the influence of climate and site, and the social, religious and moral condition of the community, and last, but not least, an appreciation of those principles on which the great artistic creation of previous ages depended. It is this that the American architect of today needs most. The European architect is placed on the same footing with the family physician and the family attorney, enjoying the absolute con-

fidence of his client, while the architect of America is too often treated as a common artisan, whose duty it is to execute a design which our independent American citizen has concocted without knowing the first principles of the theory of architecture. This is why it is that the American architect of the present day must be a scholar. His work must command the respect of and educate the public.

The requirements for admission to the department of architecture of the University of California are the same as those for the culture colleges. The first two years of the prescribed course are devoted mainly to history, English, languages, mathematics and freehand drawing which includes charcoal drawing from the cast, pen-and-ink drawing, and water coloring. In the third year the classic orders are studied, not merely to familiarize the student with the names of the different elements and mouldings, but also to train his eye to proportion. In the latter part of this year the application of the orders is made to a series of fundamental problems. Along with this course is given courses in the history and theory of architecture. During this year the subjects of analytical mechanics, strength of materials, graphostatics, steriotomy and clay modeling are treated. In the senior year the student is given a series of fundamental problems in planning. Courses in sanitation, steel construction and fireproofing, architectural mechanics, materials of construction, a continuation of the history and theory of architecture are prescribed in the fourth year. Many supplementary courses in the departments of civil engineering, mechanical engineering and geology are found desirable to the architectural student, and some of these are being taken as elective courses.

A graduate course of two years is offered, for the completion of which the student is granted a degree in architecture. No one has as yet been a candidate for this degree, but it is expected that there will be many enrolled in its courses within the next few years. In Eastern institutions the entrance requirements to courses in architecture have been gradually advanced, until, at the present time, the architectural colleges of Cornell, Columbia, the Massachusetts School of Technology and others are practically graduate schools. It has been the policy of this department, however, not to place its matriculation requirements out of reach of many who wish to study architecture, but to offer more advanced courses to those who wished to go ahead.

Two short courses in architecture are being arranged at present, and will be offered at the beginning of the fall term. One of these is a special two-year course, intended primarily for draughtsmen who have had no other opportunity of obtaining the fundamental principles of engineering and architecture. The other is a condensed form of the six-year course, in which much of the culture and engineering work is omitted.

The department is equipped with one of the best architectural libraries on the coast. At the time of its establishment in 1903, it contained 498 volumes, but many more have been added from time to time since then. Funds have also been supplied for subscription to nearly fifty architectural periodicals, which greatly facilitate the working of the department. The enrollment has increased to such an extent during the last two years that it has been found necessary to enlarge the department building to about twice its present size. This addition will be made during the summer vacation. The free-hand drawing and history classes which have heretofore been held at other points on the campus will be accommodated in the new building in a large studio room. It is expected that a much-needed course in pictorial composition and one in draped figures will soon be given.

However, in order that this be accomplished, assistance must be had in the line of instruction.

The major part of instruction in architectural design is achieved by means of individual instruction. The analysis of a design is of necessity negative rather than positive, for a design may comply with the very law of composition and be but mediocre, yet it is surely faulty if it contradicts them. The instructor points out errors and explains why they are errors, but his relation with the student is such as to allow every opportunity for the exercise of personality.

Good-fellowship in the draughting room is one of the benefits reaped by the architectural student which is not mentioned in the curriculum of courses. There is practically no restraint upon his conduct. He may talk, josh or sing over his drawing board, or he may criticise the other fellow's design to his heart's content—and the work goes merrily on.

* * *

More Anent the County Infirmary Investigation

Position of the Clinton Fabric Company

By P. A. PALMER, B. S.

THE accusation of the Good Government League that the San Francisco Board of Public Works permitted a cheap and inferior reinforcing material to be used in the Infirmary Building is, we maintain, unfair, and the result of jealousy on the part of our competitors.

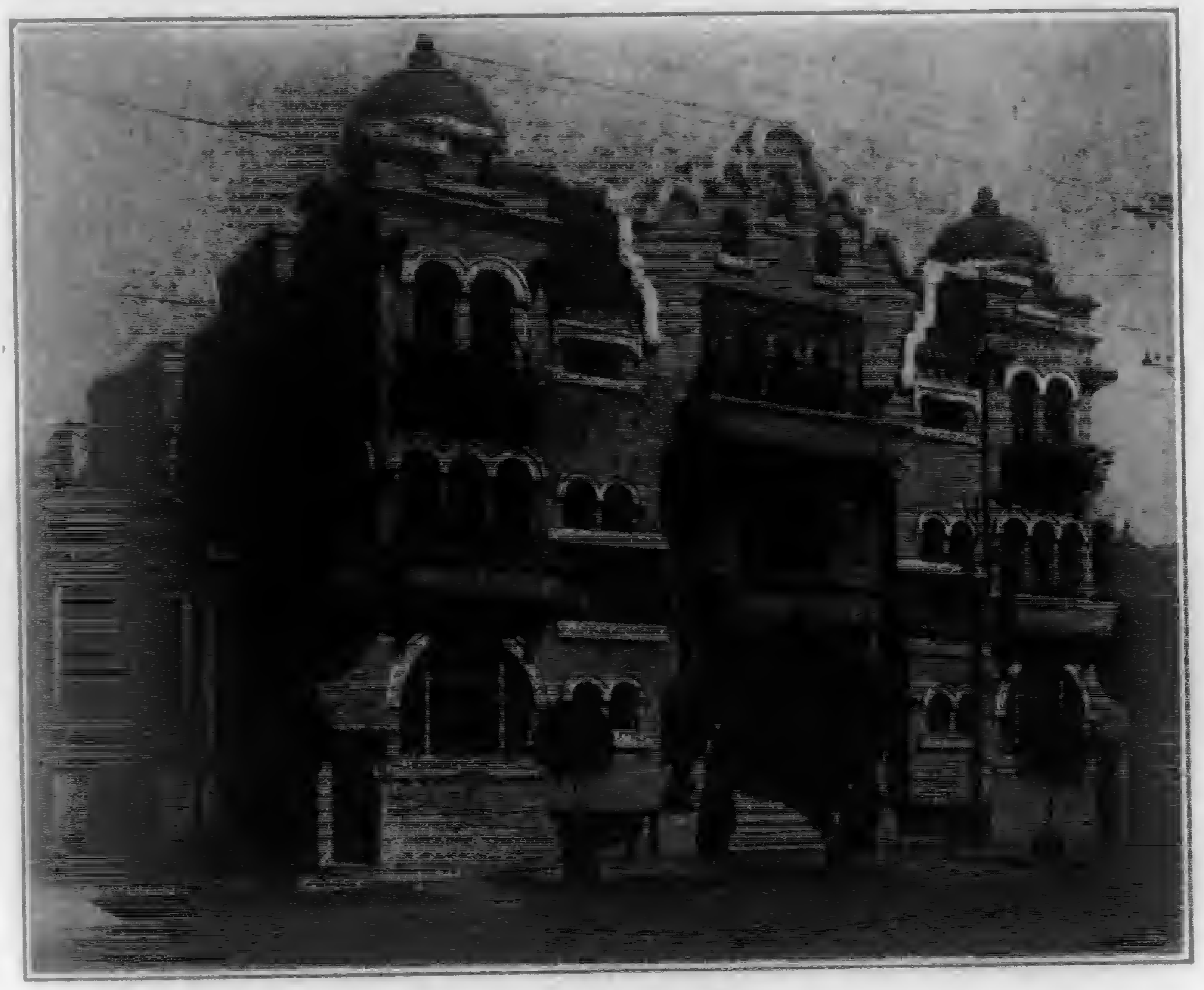
At the recent hearing of the above charges before the Mayor it was proven that the sizes of fabric used on the Infirmary were the same as selected by Mr. S. A. Jubb, Consulting Engineer to the City Architect at that time. That Mr. Jubb was justified in selecting the 4x12 mesh, 6/10 gauge wire fabric, giving an area of .087 square inches per foot width of slab as against .186 square inches as called for in the rod design, is proven both by the test made on the first floor of the Infirmary and by specifications for United States Government Work, which are based on actual tests.

Clinton fabric has been installed in a very large percentage of Government buildings built during the last ten years, the specifications for which call for approximately the same relative area of rods and fabric per foot width of slab as used in the Infirmary building. Further, these specifications call for the floors to be tested with a load of 8,000 pounds on a space of ten square feet.

There has never yet been a failure of a floor slab reinforced with Clinton fabric, which is sufficient proof of the quality of this material.

That the recognized beam formulæ do not apply to slabs reinforced with this fabric was shown by the test on the Infirmary building. Under that loading there would have been a theoretical stress of about 90,000 pounds per square inch on the fabric, which, of course, was not the actual condition as to the floors showed no permanent deflection after the load was removed; thus indicating that the elastic limit had not been reached. The slight deflection that occurred under the test load of 250 pounds per square foot, tends to show that the slabs would carry a load of approximately 500 pounds per square foot before failing.

The reason that the beam formulae do not apply to slabs reinforced with this fabric is due to the fact that the transverse wires are securely welded to the longitudinal wires so that there is in effect an arching of concrete from wire to wire. Furthermore, there is a catenary effect due to the position of the fabric in the slab as shown by the accompanying



Casa Rosa Apartments, Oakland
A. W. Smith, Architect
Equipped with Holme's Disappearing Beds. Pitcher Sliding Doors Used Throughout.

figure. These conditions produce an effect which is entirely different from that encountered in the simple beam and account for the great carrying capacity of Clinton fabric. This is the opinion of many prominent engineers throughout the country, among whom are Mr. Loren E. Hunt and Mr. Sherman A. Jubb of San Francisco. We can show the results of a great many tests that will bear out the above assertions.

This fabric is made of either soft or medium steel. The regular stock being medium steel with an elastic limit of 55,000 pounds per square inch. The latter was used on the Infirmary, and tests made for the City Architect will prove this.

I believe that a series of tests made upon slabs reinforced with the different materials upon the market and made under exactly similar conditions would be of great value to the Engineering profession and the Clinton Wire Cloth Company would more than welcome such an experiment.

* * *

Overheard in a Pullman

"Oh, George, wouldn't it be lovely to make people think we are already married!"

All right; when we get out you carry the bag and umbrella."

* * *

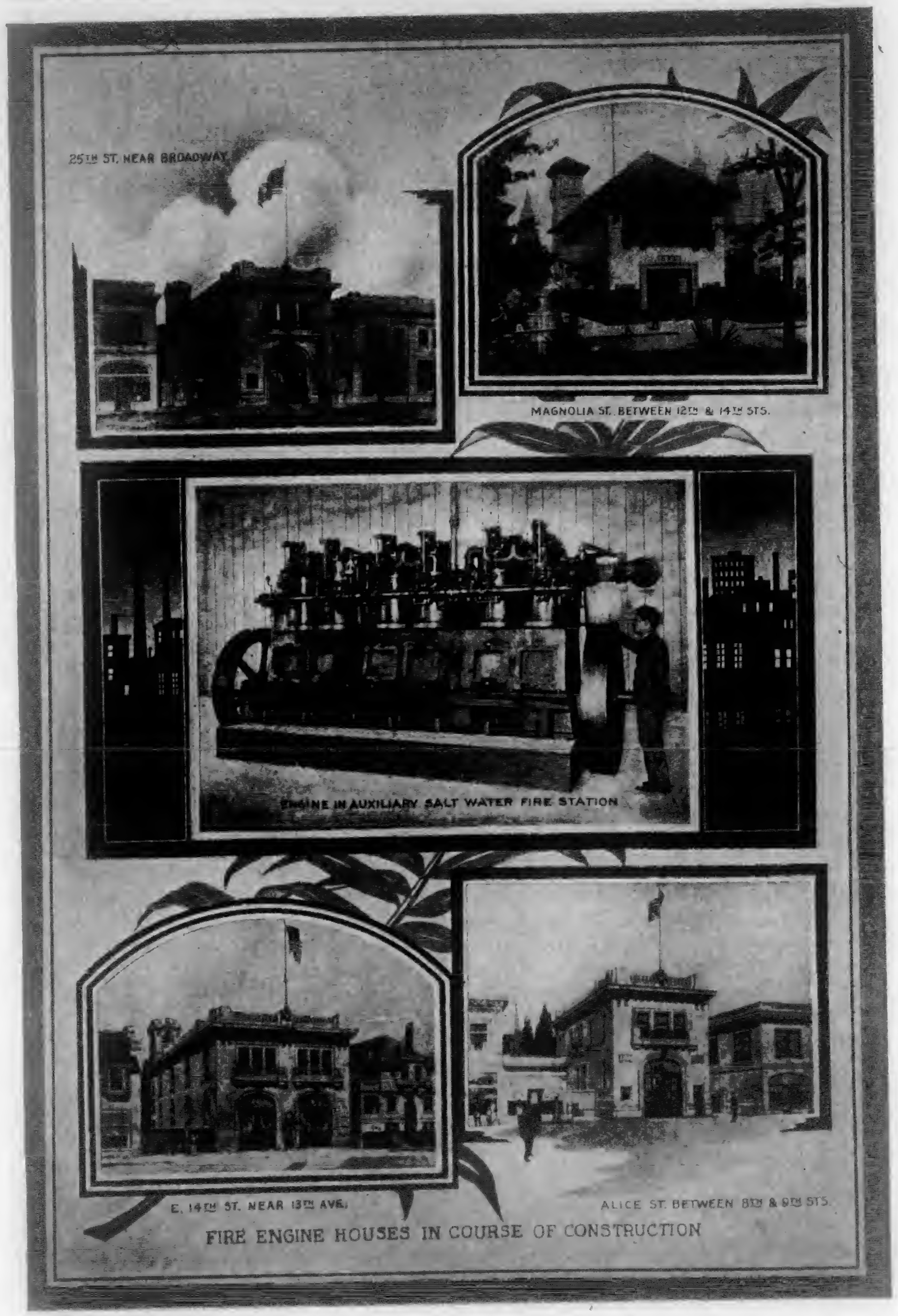
The Place for Speed

Master (severely)—John, these cigars seem to have gone very rapidly.

Valet (somewhat confused)—Yes, sir—yes—you know you've been smoking them in your automobile.

NEW FIRE HOUSES, OAKLAND, CAL.

Fred Soderberg, Architect



FIRE ENGINE HOUSES IN COURSE OF CONSTRUCTION



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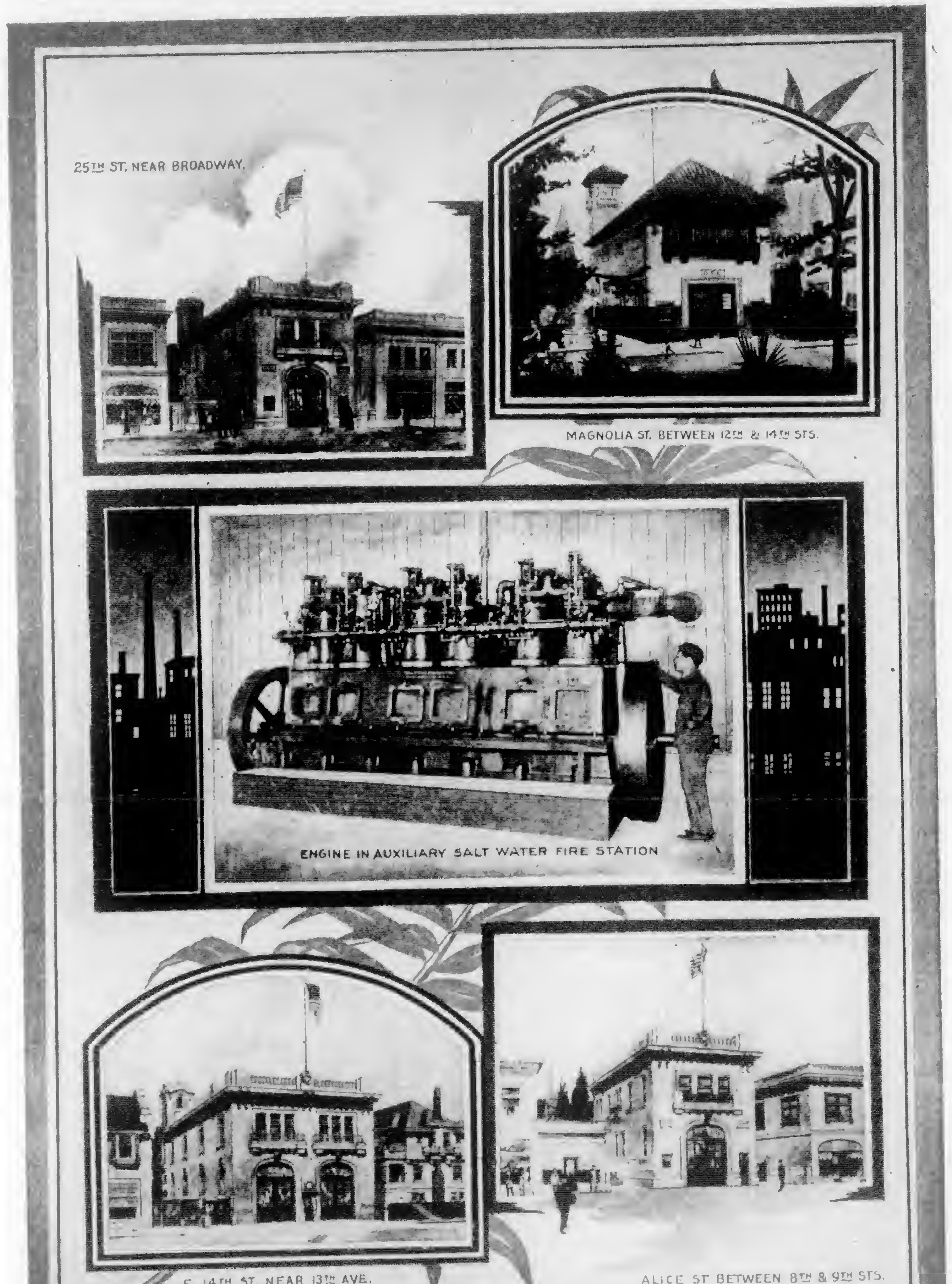
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FIRE ENGINE HOUSES IN COURSE OF CONSTRUCTION

Passenger Elevators*

By REGINALD PELHAM BOLTON.

TO SAY that the number of elevators installed in most buildings has been arrived at by guesswork, is to make no reflection upon the designers of the building or of the appliances, who in the absence of any definition of the work, or of the traffic provided by an elevator, have had no other means to guide them than a more or less confusing comparison with the plants provided in other buildings.

Passenger travel in elevators is governed by clearly defined limitations, and there is an ascertainable amount of traffic resulting from any elevator or combination of elevators.

In regular or schedule operation, this amount will be found to be a result of the number of floors which the elevator serves, and the average number of persons requiring the use of the elevator per trip.

If this combination be so proportioned, that too large an average number has to be carried on each trip, the distance between stops becomes so shortened that the speed of the elevator cannot be developed, and the time of the trip becomes unduly extended.

A point is, therefore, indicated at which best results in traffic and in time can be attained, and a rating or basis of carrying power per hour can be established so that the work of one elevator can be compared with others.

This is the first step necessary to an understanding of the service to be provided by any elevator plant, and such a basis goes further than establishing a definition of work, for it affords the means of comparing the work of machines of different speeds with others, and it also clears the way for proportioning the car to the traffic, a matter on which no information has hitherto been obtainable. Yet it is clear that if it be ascertained that with a given number of passengers per trip, the maximum result in traffic is attained, then the size of the car should be proportioned to that number and any greater or less size will affect, and probably will detract from the work accomplished.

By predetermining the size of the car for a given number of floors, without knowledge of the traffic conditions, many an architect has unknowingly predefined the limits of the work of the combined appliance, and at the same time, has brought about a combination of load and speed which does not fit the actual circumstances of traffic, and so the apparatus becomes ill-proportioned and uneconomical.

Of great importance, therefore, are those features which the designer of a building may lay down for the elevator, by a decision as to car size and number of floors, together with the weights which may be imposed upon the appliance, by the design of the car, and especially from the decision to employ in a building of a certain character, a certain number of these appliances.

It is a rather common error to assume that the visitors to a building constitute the heaviest class of traffic in elevators. It will, on the contrary, be found that the tenants and their employees are the most difficult to handle with celerity and convenience. But as both must be handled with equal satisfaction, the defined duty of an elevator must cover the two forms of traffic, one consisting of passengers going all in one direction, and the other both ways, up and down, at the same period; and this the elevator can and will do, provided it be allotted that share of the traffic which does not exceed its maximum capacity.

If it has too large a traffic assigned to it, then the same results are brought about as in the subway, where the delay of one car by overcrowding brings about delay in others, lengthening the time of travel and actually carrying less persons per hour, than would be the case were a rapid schedule maintained.

The architects' problem of providing a sufficiency of these conveniences will be greatly simplified with a defined average passenger travel for an elevator (at any given number of floors) ready to his hand, with which he has only to decide upon the extent of the tenancy of the building, on which subject he is, of all persons, in the best position to pass.

Consciously or unconsciously, he is designing his building for a certain number of occupants, somewhere between entire emptiness and an overcrowding that would result in asphyxiation.

As a matter of fact, inquiry will establish very well-defined rates of occupancy of the tenanted or rentable area, which follow naturally the position of business buildings, and the nature of the business of the tenants, and reach a most natural limitation at the minimum cubical space which, without special ventilation, will afford reasonably hygienic conditions. With these facts laid down, and the best traffic from each elevator defined, the number of elevators which will cover every contingency is ascertainable.

The definition of duty, carrying with it the establishment of the best running time and speeds, goes further, for it enables the architect to decide unhesitatingly what is the proper division to make between local and express services.

It should evidently be such as to afford the upper or express section, just as good a service, in time and in the number of cars, as the lower part. It is stated by some persons who have had to do with buildings that are so divided as to afford the upper part an inferior service, that the inadequacy does not prevent their obtaining high rentals, on account of the superior light and view of upper floors. But for how long will such advantages last? And in case of fire, what would compensate for the detriment to such a building in case of inability to remove the helpless tenants of the upper section.

Many instances could be cited where the tenants of an upper section could not be removed by the elevators in less than an hour, if the stairs were cut off.

As an illustration, assume a building of twenty-three stories, having five local and five express elevators. These are divided at the eleventh floor, with the result that the lower part has a schedule service of 200 trips per hour, and the upper section, a service of only 120 trips per hour. There is no difference between the average tenancy of any of the floors, but a tenant of the upper part has only about half the convenience in number of cars passing his floor, and occupies nearly double the average time to reach his destination, and yet is more dependent upon the service than the tenant of a lower floor.

These and other considerations go to show how desirable it is that we should all understand what an elevator stands for in the movement of passengers, and should also realize that the features which result in the work it will accomplish, are in part contributed by the architect or designer, in part by the passengers and operators, and in part, only, by the designer of the machinery.

* The general considerations indicated in this article with much contributory information, facts, and figures, are presented in the book, "Elevator Service," recently published by Mr. Bolton.

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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May Increase Dues of A. I. A.

The American Institute of Architects has sent out a circular stating that, after due consideration, the board desires to raise and expend $10,000 in restoring and furnishing the Octagon and improving the grounds, to make it a dignified club for non-resident members; also, money is needed for the library, editorial work, publication, etc. To meet these imperative necessities it is proposed to increase the dues: Associates $15, fellows $25 and initiation $25. The board of directors has issued a statement to members requesting an opinion in regard to the proposition. It is stated that the dues and fees of other similar societies are about double those of the American Institute of Architects.

San Francisco Chapter, A. I. A.

A meeting of the San Francisco Chapter, American Institute of Architects, was held in the green room of the Hotel St. Francis on the evening of August 19th, preceded by the usual dinner. Twenty-three members were present.

In addition to the transaction of routine business, the chapter extended an invitation to the officers and members of the American Institute of Architects to visit San Francisco during the Portola festival; voted to affiliate with the Architectural League of the Pacific Coast and also voted a subscription to the Portola festival fund.

At the conclusion of the business meeting, Mr. Clay Paul Gooding delivered an able and interesting address on "Waterproofing."

Sutton & Weeks Sue City of Oakland.

Architects Sutton and Weeks seek vindication in the courts of false charges against the firm for allowing the use of alleged inferior material in two Oakland schools of which they were the architects. Suit for the recovery of $3,534.86, alleged to be due as balances for constructing the Washington and Lincoln schools, has been instituted against the Board of Education of the Oakland school district and the members of the city Board of Education. The suit had been threatened for many months and came as a result of the refusal on the part of the Board of Education to pay the architects' claims.

In this the Board of Education was following the instructions of last year's Grand Jury, which made an investigation into the materials used in the construction of the school buildings.

San Diego Normal School.

Plans for the San Diego State Normal Training School have been completed by State Engineer Ellery, who will soon advertise for proposals for construction of the building. The structure will be a Class A building of reinforced concrete. It will be two stories high and will contain sixteen classrooms. The State Legislature appropriated $55,000, which is now available; $50,000 being set aside for construction and $5,000 for equipment.

A Friend in Need.

Chicago ought to have a very warm feeling toward the Commonwealth Edison Company. When the city was "strapped" last January and could not meet its payrolls the Edison Company "advanced" $100,000 on account of its tax. It recently handed over the balance of its tax, amounting to about $400,000. "A friend in need is a friend indeed."

Architect Smith and the Undesirable Contractor.

Architect A. W. Smith of Oakland will not be bothered by incompetent and irresponsible contractors. Like most architects, Mr. Smith has his regular list of contractors who figure most of his work; but if an outsider—that is, a contractor who has never performed any work for him—wishes to figure in his office, Mr. Smith is not averse, provided he meets the following conditions, which are posted conspicuously upon the door of his office:

NOTICE TO CONTRACTORS DESIRING TO FIGURE IN THIS OFFICE.

(This notice is for those contractors who have not previously figured on our work.)

Instead of Bonds we will require of new contractors that they deposit cash in bank in escrow as security.

Contractors must furnish us with satisfactory evidence that they are in a position to do this before they will be allowed to figure work.

A letter signed by the cashier of a commercial bank in which the cashier over his signature sets forth the average cash balance of the contractor for a year past will be accepted as satisfactory evidence of responsibility up to the amount of such average balance. A. W. SMITH.

When asked how it worked, the reply was "very well." Strangers would read this notice, and in a majority of cases quietly walk out, while others would make good.

It is to be deplored that any one can enter the contracting field, and to a crook particularly attractive because he has nothing to lose. This is one of the many reasons jobs are figured so close.

The responsible contractor has nothing to complain of from such a notice as Architect Smith has posted.

New Plans for Viaduct.

The Board of Supervisors of Maricopa county, Arizona, have rejected the plans submitted by Knipe & Davis for the proposed cement traffic viaduct to be built at Phoenix, on the advice of J. B. Girand, consulting engineer of the board, who stated that in his opinion the mushroom pier type of bridge, represented in the plans, could not be constructed for the amount estimated and would considerably exceed the $100,000 appropriation. New plans are being prepared.

More Outfall Sewers.

The City Council and Board of Public Works of Long Beach have instructed their City Engineer to make plans for the laying of several miles of new outfall sewer, the old sewer having been found to be defective and insufficient. Larger pipes will be used, and several new districts will also be added to the city sewer system. The work will cost about $25,000.

Aviators for Portland Sky Scraper.

Aviators will be constructed on the roof of Portland's newest office building, now being erected at the corner of Third and Washington streets by Z. C. Spalding. The plans include a landing platform for flying machines, the first to be provided on any Pacific Coast skyscraper.

Captain R. S. Greenleaf, who is in charge of the building, regards this feature as a utility that is demanded, because of the progress being made in aviation. He describes the proposed landing as a platform that will cover almost the whole roof, so constructed as to ease the drop of the bird-like machines that are expected to be soaring over the city before very long. The aeroplane pilot may pause there to regain his balance or the captain of a dirigible may alight to take on or set down passengers or load in supplies.

"Flying machine landings must be provided here as well as in the East," said Captain Greenleaf. "They will be constructed on the roofs of New York and Chicago skyscrapers, and modern office buildings of Portland must be equipped in the same manner."

"These landings will soon be a public convenience, for remarkable changes are being brought about by the perfection of flying machines, and we will be ready for them when our new building is finished."

Eastern Architect Marvels at San Francisco's Rise.

Sidney R. Badgley, a member of the Chamber of Commerce, vice-president of two commercial banks of Cleveland, senior member of the firm of Badgley & Nicklas, architects, paid a visit to San Francisco recently to study the progress of rebuilding.

After a day among the new buildings in the downtown district, Badgley expressed himself in enthusiastic terms over the wonders wrought in the last three years.

"Only by coming here can one appreciate your calamity of 1906, and only by seeing can one realize the stupendous strides you have made in rehabilitation. As an architect I am filled with wonder at what you have accomplished, while as a banker I am filled with admiration at your city's ability to finance the great undertaking."

Los Angeles Architectural Club.

The following committees have been appointed by President A. F. Rosenheim of the Los Angeles Architectural Club:

Exhibition—Myron Hunt (chairman), Octavius Morgan, John Parkinson, A. R. Kelly, A. R. Walker, E. R. Jeffery.

Educational—Elmer Grey (chairman), R. D. Farquhar, Charles S. Green.

Nomination—A. R. Walker (chairman), J. C. Hillman, E. C. Kent.

Library—L. S. Moore (chairman), W. A. O. Munsell, P. J. Van Trees.

Entertainment—J. B. Holtzclaw (chairman), R. Train, F. L. Stiff, C. B. Gallup, B. Blozer, F. C. Ayars, L. R. Bedell, C. Robinson, T. Marlowe, J. Sindorf, F. Parmentier, C. Gruenfeld, W. H. Willson, W. Werner, J. Griffin, A. Mitterhausen.

These committees have been instructed to meet at as early a date as possible for organization and active work. The new quarters of the club are on the top floor of the Union Trust Building.

The Chalet to Be the Latest Rage in Building.

The chalet is the newest type of American home. The bungalow rage is about to be supplanted by an absolute innovation in architecture. While the chalet is distinctly a novelty in the United States it would be wholly incorrect, the architects say, to represent this unique type of dwelling as an innovation in architecture. The usual point in connection with the chalet is that it originated in Switzerland and has remained in the prescribed limits of that little republic ever since—or until the recent date when Yankee architectural explorers discovered its possibilities.

Even to-day the United States is the only country to which this attractive type of structure has been transplanted. Perhaps the neglect so long manifested by other nations has been due to the circumstance that the chalet has ever been hailed as the ideal type of mountain home, and, accordingly, the vast majority of home builders who operated in no mountainous environment instinctively passed it by as something adapted only to the most rugged country.

The chalet, like the bungalow, may be constructed inexpensively, and it is quite possible to build an attractive example of this style of home for less than $2,000. At the same time it must be admitted that the chalet usually appeals to the householders who desire rather more room than can be found in the average bungalow.—Improvement Bulletin.

Salt Lake City's New Hotel.

The Newhouse Hotel, which is to be erected at Fourth and Main streets, Salt Lake City, from the plans of Architect Henry Ives Cobb, 42 Broadway, New York, will be eleven stories high and cost $1,000,000

Public Comfort Stations.

The Board of Park Commissioners of Los Angeles has approved the plans of Architects Hunt, Eager & Burns, for the erection of six public comfort stations in the various parks of the Angel City. Two will be built in Hollenbeck Park, one 18x33 feet, and one 18x24 feet; two will be built in Echo Park, one 18x33 feet, and one 18x28 feet; one in Sycamore Grove Park 18.6x33.6 feet, and one in Eastlake Park, 18x24 feet. With an exception of the one in Sycamore Grove Park, which will be faced with cobble stones, all will be of brick construction with cement plaster exteriors, and have mission tile roofing, steel lintels and cement floors. Each building will be wired for electricity, and they will be built on concrete foundations and have a very substantial appearance.

Exhibition and Convention in October.

The following committee has been appointed to take charge of the fifth exhibition of the San Francisco Architectural Club to be held in San Francisco, October 18th to the 31st: Frederick H. Meyer, chairman, William Mooser, William B. Faville, A. O. Johnson, Kenneth MacDonald Jr., Loring P. Rixford, G. Albert Landburgh, William H. Crim Jr.

M. A. Vinson has the management of the exhibition and is attending to most of the details. Mr. Vinson has sent invitations to all the Eastern chapters of the American Institute of Architects, and President Cass Gilbert has written that he will endeavor to be present. Mr. I. K. Pond of Chicago may also grace the gathering with his presence.

While the exhibition is on, the first annual convention of the Architectural League of the Pacific Coast will be held, the program including several business meetings, a banquet and other amusements. It is expected that at least fifty delegates from the Northwest will be present.

The complete program follows:

Press View, Monday, October 18th, 2 to 5 p. m.

Club Reception to visiting Architects, Monday, October 18th, 8 p. m.

Exhibit open to Public, October 19th to October 31st, inclusive.

Hours:—10 a. m. to 10 p. m. Daily. 2 p. m. to 6 p. m. Sundays.

As this is the first Architectural Exhibition held in San Francisco since the fire of 1906 the San Francisco Architectural Club will endeavor to present for inspection the most complete collection of architectural renderings and decorative work ever seen in the west.

The exhibition will be illustrative of architecture and the allied fine arts. It will consist of drawings and models of proposed or executed work in structural, decorative and landscape architecture; sketches and finished examples of decorative painting; sketches, models and finished examples of decorative and monumental sculpture; drawings and models of works in the decorative arts; and photographs of executed work in any of the above branches.

Entry cards and labels will be supplied by the Exhibition Committee. Each exhibit must be marked on the back with entry label and duplicate on an entry card, mailed to the Exhibition Committee.

It is the desire of the club that the exhibition be made up entirely of high class design. In San Francisco all exhibits will be selected by the jury appointed by the Exhibiton Committee, with this in view.

All accepted exhibits must remain until the close of the exhibition.

Exhibits will be refused which do not bear the name of the designer.

The committee reserves the right to change any title unduly conspicuous.

Drawings must be properly framed or mounted, and it is especially requested that borders and mats on stretchers and frames be reduced to a minimum.

The omission of glass is requested on all exhibits if possible.

The San Francisco Architectural Club will arrange for collectors and shippers in Seattle, Tacoma, Spokane, Portland, Denver, Salt Lake City and Los Angeles, and exhibitors notifying the committee of their intention to exhibit will be advised as to what date and by whom their exhibits will be collected.

A committee for selecting drawings will be appointed in each city named above.

All shipments of exhibits from our packers will be insured in transit. The entire exhibition will be insured while in the club's possession.

Unless otherwise specially agreed, the San Francisco Architectural Club will not be responsible for the loss of, or any damage to, any of the exhibits, arising from any cause whatsoever, during carriage or while in custody.

All accepted drawings and photographs will be returned at the expense of the San Francisco Architectural Club.

The sending of an exhibit to the Fifth Exhibition of the San Francisco Architectural Club shall constitute an assent on the part of the sender with the conditions above set forth.

Address all correspondence regarding this exhibition to the Exhibition Committee, San Francisco Architectural Club, 833 Market street.

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THE COMING ARCHITECTURAL EXHIBITION

Every architect in San Francisco should contribute his work to the fifth exhibition of the San Francisco Architectural Club, which is to be held in the Bay City, October 18th to 31st. Simultaneously the first annual meeting of the Architectural League of the Pacific Coast will take place, and members of the League from many of the Coast cities will be present. There will also be several distinguished Eastern architects on hand. These circumstances, together with the fact that the exhibition is to be open to the public, should add material interest in the event. It will be the first time since the fire that members of the profession and the public have been permitted to inspect the drawings of San Francisco architects. The exhibition held in the Merchants' Exchange building over a year ago was limited to a few exhibitors and could hardly be called a representative display.

It is hoped the committee in charge will be liberal in alloting ample space to contributors—lack of such accommodations having been the cause of much complaint at previous exhibitions held in San Francisco. Undoubtedly many of the drawings that will be shown will be of completed work, and this should add interest in the exhibit from those who have seen the finished buildings but not the original sketches. Then, too, it will acquaint the public with what each architect has been doing—the equivalent to an advertisement for him.

After the San Francisco exhibition there will be one in Los Angeles, a third in Seattle and a fourth in Portland. These will fall several months apart, and naturally there will be considerable good-natured rivalry as to which city will outdo the other. Much of the work that will be shown at these exhibitions will be published in The Architect and Engineer with appropriate criticism.

FIRE PROOF BUILDINGS IN THE MINORITY

It is estimated that of the fourteen or fifteen million buildings in the United States, less than 10,000 are even moderately fireproof, and less than 1,000 can be called practically fireproof. The wealth destroyed by fires in ordinary years is in excess of the entire value of the fireproof building material produced, but with the awakening of public sentiment against the construction of firetrap buildings it is to be expected that the demand for fireproof building material will increase by leaps and bounds, and that in a few years the greater portion of this waste will be obviated and its value utilized toward the construction of more fireproof buildings.

The reduction of insurance premiums and saving in cost of maintenance will in about ten years equal the excess of cost of a practically fireproof building over one not fireproof. Improved methods of construction will do more than legislation to bring insurance rates down, because they will reduce losses, and the reduction of fire losses is the surest way to reduce rates.

A REAL ARCHITECTURAL NOVELTY

New York is rapidly gaining a reputation for architectural novelties of interest to the architect, the builder and the engineer, and the list of attractions for members of these professions is constantly growing. One of the latest novelties in the architectural line is the new building which will soon rise on the present site of Hotel Metropole, now in process of demolition, at the junction of Broadway, Seventh avenue and Forty-second street, borough of Manhattan, New York. The unique feature of the structure that is to occupy this site is not so much in its size as in its peculiar construction, the design calling for a building only six stories in height, but from the center of it will rise a tower 30 feet square and extending 200 feet above the level of the street, covered by advertisements of various kinds and illuminated at night with such brilliancy as to make the "Great White Way" even more dazzling than at present.

The building is designed in English perpendicular Gothic, with long lines to emphasize the height, and with an ornamental cornice with corner pavilions and high battlement. The top of the tower is to be treated in a similar manner, and from the extreme peaks will flutter numerous banners and streamers. The plans have been prepared by Henry Ives Cobb, a well-known architect, and every effort will be made to have the structure completed by the end of the current year. All of the skill of the electrician will be utilized to make this tower an attraction as well as a striking feature of the Eastern metropolis. Some might urge that the multiplicity of advertising signs on the tower would prove a serious objection, but in refutation of this charge it is declared that the arrangement will be such as to render the display attractive and pleasing to the eye, and will constitute a beautiful architectural effect by day and a tower of light by night.

First Annual Meeting of the Architectural League.

The first meeting of the Architectural League of the Pacific Coast will be a success, if the activity and enthusiasm shown by the various committees appointed by Mr. Willis Polk, president of the league, is any indication.

Mr. Louis Christian Mullgardt is in charge of the "Committee to Formulate the Business Program" for the three days' meeting. He is corresponding with the members of the Executive Board of the league in the various cities that are represented in regard to having the architects in each city take an active part in the meeting.

Mr. G. A. Applegarth is chairman of the committee to plan an entertainment program that will make the visiting architects remember the first meeting of the A. L. P. C. in San Francisco. This committee will work with the committee appointed by Mr. Albert Pissis, president of the San Francisco Chapter, A. I. A., for the same purpose.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

Warm Air Furnace Heating.

THE great advantage of a warm air furnace heating system is that it supplies fresh warm air, and this single feature, from a hygienic standpoint, places the warm air furnace in a position far superior to that of any other form or system for warming dwellings. Moreover, the expense for installation, operation and subsequent care of the warm air furnace system is less than that of any other.

The warm air furnace, to be effective, however, must be large enough. It is, in fact, a matter of economy to use a furnace one size larger than is actually required, and it must be borne in mind, too, that the relation of the air supply, the size of the piping and the size of the registers to the furnace and to the rooms to be warmed are very important factors in the success of a warm air furnace-heating system.

The success of the system depends also upon the careful installation of the furnace, the piping and the registers.

Every warm air furnace heating system is a problem in itself. The rules entering into the science of heating cannot be ignored, nor can success be attained unless these rules be considered and applied to the problem with judgment. Even after the exercise of care and thoughtful attention, it sometimes occurs that a certain run of warm air pipe, or, perhaps, the entire system, fails to realize the expectation of the owner and the heating contractor, and when this occurs it should be borne in mind that "every effect must have a cause." Search for the cause, remove it and the system will be successful. Minimize the chance of failure when planning a warm air furnace heating system by observing these facts: (a) That warm air, following the law of nature, flows upward, and as the natural movement of the warm air is upward, it follows that the greater the elevation of the warm air pipes the more rapid will be the flow of air.

(b) That warm air flows toward the point of least resistance, and the velocity of the air movement in a warm air pipe depends upon the excess of temperature of air in the pipe; depends upon the height of the outlet above the furnace; depends upon the absence of frictional resistance in the pipe and depends also upon the absence of pressure resistance in the rooms to be warmed.

Warm air furnace heating, to be successful, should be considered in connection with the ventilation. Circulation of the air is, in the absence of scientific ventilation, an acceptable substitute. Its adoption, in the absence of ventilation, provides a means for displacing the air of lower temperature from the rooms.

Success or failure of a warm air furnace heating system finally depends upon the smoke pipe and the chimney. If the smoke pipe is not the proper size and the chimney does not have sufficient capacity and is not properly constructed, it is useless to expect the successful and satisfactory operation of the furnace.

The first important factor in furnace installation is the determination by accurate rules of the space to be warmed. Then to determine by positive rules the size of the furnace required. These to be followed by a proper consideration of the piping, the risers, the registers, the smoke pipe and the chimney.

Manufacturers, with but one exception, have referred to furnace capacity as equal to 20,000 to 30,000 cubic feet, and although this is a custom of long standing it is incorrect and frequently leads to the installation of a warm air furnace entirely too small for the work required of it. It is much the better plan to base the capacity of a furnace on some system that will consider both the wall and glass exposure, as well as the actual cubic feet in the rooms or dwelling. These three elements, the actual cubic feet, the next wall exposure and the glass exposure, might be termed gross cubic feet.

The capacity of a warm air furnace on the gross cubic feet plan can be determined by taking into consideration the average diameter of the firepot by a formula that considers too the consumption of a certain amount of fuel per square foot of grate surface per hour.

The size of piping and registers required to warm a certain gross cubic feet may also be determined by fixed and positive rules.

The limit of warm air piping that a furnace will carry with success and without the danger of overloading the furnace can be determined, also the amount of air to be introduced to the base of the furnace, may be ascertained by a rule that will give sufficient air to fill all the pipes. If this is not done—namely, the admission of sufficient air to fill all the pipes—the success of the system is endangered.—Exchange.

Heating a Ten-Room House Economically.

A heating, ventilating and humidifying system was installed in a house in Glen Ridge, N. J., which was operated at a very low cost, according to a writer in the Heating and Ventilating Magazine, and one-third of the heating was indirect. This is contrary to ordinary experience. The owner attended personally to the stoking of the boiler and thus not only had the opportunity of observing the coal consumption, but no doubt effected a considerable saving over the ordinary attention given by servants.

He has a thermostat attached to the boiler and also to the cold air inlet damper, which helps very materially in the saving of coal, and believes that every furnace or other heater should be equipped with such a device.

Another important point is that the house is never heated to a point above 65 degrees. The family has become used to this temperature, and the owner considers 65 degrees far more healthful than the 70-degree standard that is so generally insisted upon. He believes the 70 degree point is maintained largely because people have become used to it and not because it is really necessary.

The feature of this ventilating system in this house, which makes it an exception is the application of the principle of suction in an automatic system of ventilation. Through the use of the chimney as a ventilating stack, a suction is established in all the rooms, hallways, and even in the cellar. The air passes out of the ventilating flues in the chimney through an opening equivalent to 29 by 23 inches.

The incoming air is heated to one-third of the desired point as it leaves the register underneath the radiators, the radiators themselves supplying the other two-thirds. This movement of the air goes on day and night. It operates entirely without machinery.

The Evils of Cheap Plumbing.

In the building of a home one of the chief demands on the owner is to see to it that the plumbing arrangements are properly made and the plumbing work properly done. Every feature of the installation, such as the location of closets and lavatories, should be carefully planned with the one single idea of making sure that the premises are sanitary. If the builder is wise he will see to it that the specifications call for high-grade material. Cheap piping and plumber's supplies invariably prove the most costly in the end. They necessitate an almost endless series of repairs and inconvenience to the housewife, which disables her for the efficient exercise of her duties to the home. Much complaint is made of the plumbing exercises, and the comic artists have made them the subject of their jibes for a long time, but the amount of the bills is not to be considered if the owner of a home honestly desires to equip his house with the best in the market in the matter of plumbing supplies. The best is the cheapest by all odds.

The features to be considered on the outside of the house are the roof work and the conductors leading from the roof and the waste pipes from closets, bathrooms and sink. The ridges, hip-rafters, valley gutters and platform roofs are often laid with zinc or galvanized iron, but a more durable job can be made with lead. Care should be taken in making proper junctions at the overlaps of either zinc, iron or lead. On this depends the prevention of water finding its way into the roof and causing unlimited decay. The eve gutters and down pipes, made of cast iron, should have the required clips at the joints and be properly secured and supported. It is preferable, for sanitary reasons, that all soil and waste pipe should be erected outside the walls of the building. Water closets may be so arranged that they will be next the back wall or either side walls of the house, and the branch soil pipes should be carried through the thickness of the wall and inserted into a "branch horn," cast on the upright soil pipe, and jointed thoroughly with red lead and rope yarn.

Many homes are rendered practically untenantable by the bathroom being too close to bedrooms. The fittings of the bathroom, when exposed, should be of gunmetal or nickel-plated. If common iron piping is employed it should be painted. Piping above the flooring should not be covered but left exposed, so that any leakage may be readily detected, and in its arrangements the law of gravitation should be carefully taken into consideration. This latter is not only important but absolutely necessary. The location of hot water tanks and their various piping connections calls for the most scientific handling, and unless they are installed in a practical manner satisfactory results cannot be obtained—Shoppell's.

A Novel Illumination of a Church.

AT a prominent society wedding which recently took place in Montgomery, Ala., a lighting effect was produced which probably is the first of its kind ever attempted. The novelty of the scheme consisted in placing four flaming arc lamps on the outside of the church, near the stained glass windows, and covering the installation with white canvas. The decoration of the interior of the church was carried out on an elaborate scale, and involved the use of many incandescent lamps; but the crowning feature of the whole affair from the decorative standpoint was the turning on of the arc lamps, which gave the effect of the sun rising and shining in through the windows. It is thus described in a local paper:

"Lights were arranged on the outside of the church at each stained glass window, and the light was reflected inside. At the beginning of the ceremony all of the other lights in the church were turned out, and only these were used. The scene was as one at sunrise, the lights changing from a soft mellow glow and gradually growing brighter and brighter, until when the ceremony was over and the young couple were pronounced husband and wife, the lights burst forth in great splendor, as the rising sun on the dawn of a new life."

Electrical Wiring and Equipment.

THE following interesting suggestions on the important subject of electrical wiring and equipment of buildings were furnished the Improvement Bulletin by E. M. Raetz of the Kennedy Electric Company of Rochester, Minn., and are along the same lines expressed by A. W. Pike, formerly with the Butte Engineering Company, in this department several months ago:

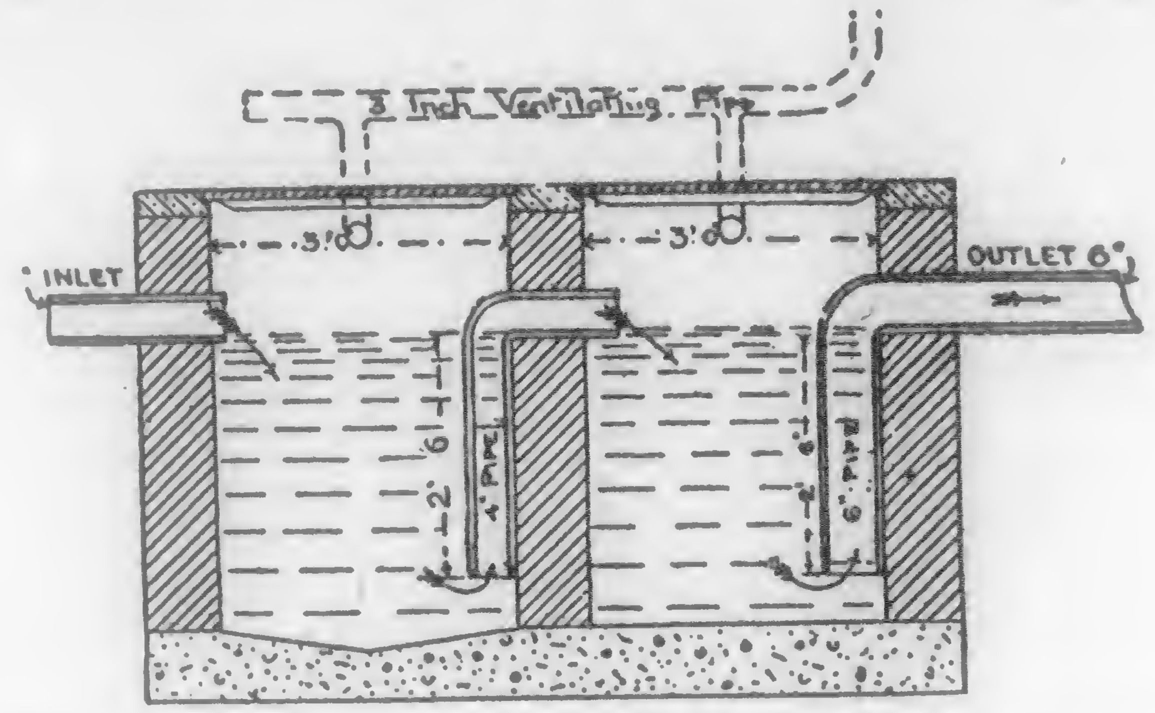
"The electrical wiring and equipment of buildings is a subject which does not seem to receive its proper share of attention by the architect and builder. The owner, as a rule, being ignorant of the subject, leaves it to the architect and builder—the architect is sometimes no better posted than the owner and leaves it in turn to the builder, who is trying to make all he can on the job and cuts the wiring, etc., down to a minimum. At a recent general contractors' meeting the electrical contract was referred to as one of the 'insignificant trades.' This seems to be the attitude of architects and builders in general, but as methods of building construction progress the importance of this work is being brought out and the necessity of careful planning is becoming more evident. In the large modern structures in the bigger cities, with a well planned equipment, even illuminating engineers

are employed to secure the best results from artificial illumination.

"Poorly drawn specifications (or sometimes the subject is not even mentioned), are responsible for many inefficient and defective installations. A rigid specification will not only secure for the owner a better job, but will put all bidders on the same basis so far as requirements are concerned, and the general tendency would be toward a higher standard of construction instead of 'cheap' work, as the present tendency is to let the job to the lowest bidder, where there is a loosely drawn specification which allows of deviation in figuring.

"There are even cases where contractors submit their own specifications and base their bid on same, claiming to reduce the cost to the owner. Such proceedings are always open to question and should not be considered by the architect and owner.

"In specifying a certain make or brand of article 'or equal,' it would be better to name several makes of such articles to allow of fullest competition and leave out the words 'or equal,' as the question always arises who shall decide whether or not the article to be substituted is the equal of the one named, as the architect is often incompetent to judge (and could hardly be reasonably expected to know), as to the merits of all modern devices,



Sketch shows British practice in caring for floor drainage from a garage.

of which there are so many being put on the market.

"The real necessity seems to be to have a competent engineer draw up a specification, the cost of which would be moderate and thus secure for the owner a satisfactory and proper installation of electrical equipment.

"The above is the writer's conclusion at the end of ten years' experience in the electrical contracting business, and to this I might add that the best results are obtained by the fullest co-operation of the architect, builder and electrical contractor."

Floor Drainage in a Garage.

This is an illustration of the method in which floor drainage in a garage is cared for in British practice. The floor drain enters from the left into a double compartment, settling tank and cesspool, which has a tight cover and is furnished with a 3-inch ventilating pipe to the roof. The first compartment has a depressed floor, making it more easy to remove the sand and mud, a turn-down elbow of 4-inch pipe with a seat of 2 feet 6 inches, which leads into the second compartment, where a 6-inch turn down elbow with a seat of 2 feet 6 inches leads to the main drain. It is quite improbable that the gasoline would reach the sewer if such a settling tank and cesspool as this were constructed.

Their Bungalow.

Just as a pair of robins build
Their love-wrought nest without the aid
Of some conceited bird who dares
To tell them how it shall be made,
So John and Mary proudly planned
Their home, and deemed 'twould be a sin,
Amid their rosy dreams, to let
An architect come butting in.

Alas! it was not wisely planned,
For doors and windows, so they find,
Are out of place; some rooms too large
And some too small; but, never mind!
With pride they show their house to friends,
Who, as they view it, come to know
Why John and Mary will persist
In calling it their "bungle, oh!"
—Nixon Waterman in the Saturday Evening Post.

By the Way

Some Industrial Information Worth the While

Automatic Sprinklers for Fire Protection.

The use of automatic sprinklers for fire protection is becoming more general as the advantages of the system are understood by the owner. The following letter from a large California industry, sent unsolicited, is self-explanatory:

Pacific Fire Extinguisher Co.,
San Francisco, Cal.

Gentlemen:—Although you have not asked for any statement from us, in reference to the equipment which you installed at our plant in Crockett last year, we are so well pleased with same that we take the liberty of writing you, to express our satisfaction with the manner in which the equipment was installed, and the perfect working of same since.

At the time we decided to install a sprinkler equipment, we obtained quotations from the different manufacturers, and also from engineers who wanted to put the equipment in on the basis of cost and a certain percentage. At that time we were somewhat afraid that the installation of the equipment would interfere considerably with the handling of sugar in our warehouse in which the plant was to be installed, and after very careful consideration of all the different makes of heads and the different propositions submitted, we decided to accept yours, and can only say that we made no mistake in having the installation made by your good selves.

The severe test that we subjected the pipe and hose to, viz.: 125 pounds pressure for two weeks, proved that everything was more than guaranteed by you. We sincerely trust that this letter will be the means of bringing you further business, as we feel sure that any concern that will install a sprinkler system, similar to the one installed for us by your good selves, will be perfectly satisfied.

Yours very truly,

California & Hawaiian Sugar Refining Company,
Geo. M. Dolph,
General Manager.

Eastern Contractor Gets Job.

Ambrose B. Stannard of New York city has been awarded the contract for partitions, screens and interior finish, etc., in the San Francisco Postoffice, the contract price being $86,348. Time to complete, June 15, 1910.

Handsome Hardwood Interior.

One of the handsomest offices in San Francisco is that just finished and lately occupied by Messrs. Balfour, Guthrie & Company on California street, east of Sansome, and adjoining the Alaska Commercial Company's building. Balfour, Guthrie & Co. occupy the entire building, which was built for them from plans by Architect L. B. Dutton. A feature of the offices is the handsome hardwood interior trim in Jenisero and West Coast mahogany. The former is treated in a dull wax finish, which makes this already beautiful wood still more attractive.

The interior trim was furnished by the S. H. Harmon Company's mill from lumber and veneers supplied by the Dieckmann Hardwood Company.

Tabor Sash Fixtures.

The Tabor Patent Strip and Fixtures for revolving, reversible and removable windows are much in demand, and the San Francisco agents, Boyd & Moore, report recent installations as follows: Owens & Unger building, Levi Strauss building, Bliss & Faville, architects; Piedmont School, Albert Farr, architect; Wood building on California street, Ralph W. Hart, architect, and other structures. The Tabor goods only recently have been placed on the California market, and if the contracts already taken are a criterion the local field promises to be a lucrative one for the Eastern manufacturers.



Leary Building, Seattle, Wash.
Beezer Bros., Architects

The Leary Building.

The Leary Building, Seattle, Wash., nearing completion, shows nine stories, but it is the intention of the owners to make it eighteen stories in the near future. Corrugated bars, Hydraulic Pressed Brick Company's non-absorbent face brick and R. I. W. No. 232 paint were all supplied by F. T. Crowe & Co.

The National Bank of Commerce is to occupy the street corner fronting on Second Avenue and Madison Street.

The offices in the building are undoubtedly the most resplendently equipped in the Northwest and are supplied by the F. T. Crowe Company with Winslow's solid bronze doors and bank fixtures.

The architects are Beezer Bros. of Seattle and Spokane and the contractors the James Black Masonry & Construction Company of St. Louis.

Blue Print Papers.

Blue Print Papers is the title of a four-page leaflet just issued by the Keuffel & Esser Company. The following, taken from the leaflet, should interest architects and engineers: "The results obtained in making blueprints depend upon the careful selection and application of the chemicals and essentially upon the quality of the paper employed. It has, therefore, always been our endeavor to maintain the high quality of our papers and improve our formulas for coating

these papers, and to produce papers best adapted for their purpose. The reputation which our several brands of blueprint paper enjoy, proves that our efforts have been successful, and that our papers may be depended upon for the work for which we recommend them.

"We have a well equipped plant at our New York house, and at our branch houses at Chicago, St. Louis, San Francisco and Montreal, for blue printing and black printing of any kind by sun or electric light. Our work is prompt and of the highest quality, and tracings are carefully guarded."

Automatic Elevator Guide Lubricator.

The most ingenious inventors and intelligent engineers have striven since the advent of the elevator to discover some means whereby the difficult, disagreeable and dangerous task of keeping elevator guides in condition might be eliminated.

This has at last been accomplished by the Parks non-friction automatic lubricator, the inventor of which has attained this result after long study and numerous experiments.

The device consists mainly of an air compression cup with attachments that conduct the lubricant to all three sides of the guide at the same time.

It takes but a few minutes to fill the cup with grease, after which the elevator, as far as lubrication is concerned, will require no further attention from four to six weeks.

The lubricator only feeds while the car is in motion.

Lubrication stops when the car stops, thereby preventing waste of grease, dripping, soiling of walls and grill work, or damage to clothing of passengers.

A small amount of grease applied at the right time in the right place is all that is necessary to properly lubricate the guide of the most active elevator.

The device is easily atached to elevator cars of any make, and has been examined by many of the most noted engineers and mechanicians in the country, who after the severest possible tests have pronounced it the only invention for the purpose ever known that satisfactorily does the work.

Boyd & Moore, 356 Market Street, San Francisco, are the Coast distributors and they have installed the device in such prominent structures as the Whittell, the Whitney and the Alaska Commercial buildings.

Denatured Alcohol—Its Production and Its Use.

Alcohol is the coming fuel of the world. It can never be exhausted. So long as the sun shines on our fields they will produce it for all time to come, and mankind need no longer fear the exhaustion of our coal deposits, for the use of alcohol as a means for cooking, lighting and heating has come to stay. The use of denatured alcohol everywhere for lighting, heating, cooking and other domestic purposes is sure to become general throughout the country. Hitherto the main objection has been the cost, but this has been removed. To-day, in fact, untaxed alcohol is being manufactured so cheap as to successfully displace kerosene, gas and electricity for lamps, stoves and heaters, and so confer a positive blessing on the consumer, for it has many advantages over them. At present there are only few large distillers making denatured alcohol, but many concerns are preparing to engage in this business, and a multitude of farmers will soon set up small co-operative plants.

In compliance with numerous requests for more detailed information relating to the utilization of wood waste by distillation and a general consideration of the new infant industry of wood waste distilling, including a full description of the apparatus and appliances used and the principle involved and also methods of chemical control and disposal of the products, illustrated by seventy-four engravings, a book of 156 pages, bound in cloth, will be sent to any address in the United States, postpaid, on receipt of $3.20. This book also explains and treats of the manufacture of grain alcohol from wood waste. It opens a new field for investigation. Address Wood Waste Distilleries Company, Cleveland, Ohio.





Walter B. Fawcett

A Hustling Oakland House.

One of the most enterprising among the Oakland business houses is the California Mantel and Tile Company, of 110 Telegraph avenue, Oakland.

Prior to removing to its present quarters, on May 1st, the only large job the company had done was the tile work on the Taft & Pennoyer building, all of which was installed by this firm. Since that time the company has added to its equipment, and increased its capacity, until there is no contract, in the tile line, too large for it to handle.

The largest tile contract awarded in Alameda County for 1909, the H. H. Hart residence, in Claremont, was secured by this company, in competition with the oldest tile houses on the Coast. The Company also has the contract to furnish the tile for the Western Pacific passenger depot in Oakland, and has just completed the tile roof on the Western Pacific depot at Sacramento.

The show rooms of the California Mantel and Tile Company are a credit to the City of Oakland, and compare favorably with those of any firm on the Coast, as to the variety and the attractiveness of the goods displayed, their lines including wood, tile, brick and stone mantels.

The president of the company, Mr. Walter B Fawcett, is one of the most wide-awake young business men in Alameda County, and he has associated with him, as secretary, Frank Hus, and as treasurer, Charles H. Pfeiffer, while Mr. B. A. Wallman is store manager. Satisfactory work at fair prices; courteous treatment—these are the pillars that support their business enterprise.

Eastern Architects Invited to Attend P. C. L. Meeting.

Mr. Lewis P. Hobart is in charge of the Invitation and Reception Committee. He is planning on inviting a great many of the Eastern architects to take a Western trip at this time. Hotel accommodations have been reserved for 100 delegates. The rooms will be held up to October 10th. As San Francisco will be crowded at the time of the convention, because of the Portola Festival, it will be well for those contemplating attending the convention to make reservations in advance. Address Mr. Lewis P. Hobart, Crocker building, San Francisco.

Keystone Boilers Are Best.

(From the San Francisco Call).

It is no longer necessary to go outside of San Francisco to obtain the mechanical equipment for the most complex or elaborate establishment. The new Southern Pacific hospital has been provided with Parker water tube boilers built by the Keystone Boiler Works of San Francisco. The contract amounted to $130,000. The money remained in San Francisco, went to pay home labor, and in the natural channels of trade is distinctly a local asset. It is not so long ago that it was thought necessary to "go East" for such machinery.

The boiler in question is essentially a San Francisco product. It is the invention of a former resident of this city. In its mechanism it departs from the old methods of steam generation. The water is fed into the upper part of the boiler and circulates downward, the steam being discharged from the lower tubes.

The installation at the Southern Pacific hospital is said to be the most elaborate in its appointments on the Coast. The machinery is set in white enameled brick in the power station. All the structural material is white. The boilers take on the appearance of two large clocks, so perfect and uniform are the faces, the doors, the tubes and the pendulum gauge chains.

A Young Firm.

One of the youngest of the contracting building firms in San Francisco is Taylor & Johnson, whose offices are in the Postal Telegraph building.

Mr. Charles L. Taylor is a native product, having been born in California and educated in the public schools of Oakland and the University of California, from which he graduated in 1893.

He started in business as an architectural draughtsman, and followed that profession until 1897, when the Spanish-American war broke out. Mr. Taylor entered the employ of the Union Iron Works, where he continued for eight years, in charge of the armor and armament work on all the ships that the Union Iron Works built for the government.

Immediately after the great fire Mr. Taylor assumed charge, as chief draughtsman, of the architectural department of the Ferrolite Company of San Francisco, which was doing a large volume of heavy construction work. On the abandonment, by that company, of the architectural branch of their work, Mr. Taylor was given charge of the purchasing and estimating department of the Jas. Stewart Company, of New York, when that firm entered the local field. Mr. Taylor continued with the firm until they withdrew from San Francisco, in January, 1909.

The Emporium, the Orpheum, the Temple Emanu-El—these are a few of the buildings erected under his supervision.

On February 1, 1909, Mr. Taylor formed a co-partnership with Mr. Henry T. Johnson, to carry on general building construction.

Mr. Johnson was educated at the Western University of Pennsylvania, graduating in the engineering class of 1900. After two years with the Columbia Bridge Company, of Pittsburg, on structural work, he was with the Pittsburg Coal Company, as superintendent of construction of shafts and power houses, for two years; one year at Pt. Richmond, as assistant master mechanic for the Standard Oil Company; one year at Albuquerque, on construction work for the Santa Fe; then with Maxwell & Bugbee of San Francisco, as superintendent of construction.

Taylor & Johnson have just completed the Haslett warehouse, at Third and Townsend streets, which is noteworthy by reason of the size of the timbers used, being the largest used in San Francisco since the fire, some single beams running over one thousand feet, board measure.

The Starr-King Church, at Geary and Franklin streets, the first stone building erected in San Francisco after the fire, was built by this firm, as was the Security Investment Company's office building on Sacramento street.

The firm is now engaged on the Nelson-Morris Packing Company's smoke house on Pacific street, near Drumm, the pile foundations for which are completed, and the basement water-proofed.

Makes Store Fixtures.

One of the best known and most reliable houses in the building line is that of Frank S. Ostrowski & Son, of 214-216 Eighth street, San Francisco.

Mr. Ostrowski began the manufacture of store, office and bar fixtures in 1899, on Eighth street, and has followed the same business at the same stand ever since.

Later on the firm added the manufacture of drug store fixtures, and has become the recognized leaders in this specialty, for the reason that a large stock is kept on hand.

It is now possible for a druggist to order his store fixtures, specify his alterations, and have the whole installed in from three to six days.

In former days business was done mostly on a cash basis, but, since the fire, conditions have changed and business is done, largely, on the basis of time payments.

The earthquake of 1906 left the Ostrowski establishment practically without damage, but the fire, two days later, completely destroyed the plant.

After the fire several of the old firms engaged in the office and store fixture business dropped out, but Ostrowski & Son rebuilt on the same lot and continued doing business.

On the 16th of April, 1909, the firm was doing a prosperous business, when the St. George Hotel, around the corner, took fire and the flames burned up half a city block. The Ostrowski building was again destroyed, and the firm lost $15,000, with an insurance of $8,000.

The weak man is overcome by misfortune—the strong man laughs at it, and starts anew.

Ostrowski & Son are re-established, at the old stand, equipped with modern machinery and prepared to fill, at the shortest possible notice, any orders that may be entrusted to them.

Why He Got His.

The vender of images, who had just been thrown out of a large office building, wept bitterly as he looked at his torn clothes and broken wares.

"Who did this?" inquired the friendly cop. "I'll pinch 'em if you say the word."

"No; it was my fault," said the victim, gathering up the remains of a plaster image. "I insisted on trying to sell a bust of Noah Webster to a meeting of simplified spellers."—Denver Republican.

Two Brick Companies Consolidate.

The Stockton Fire and Enamel Brick Company, located at Stockton, Cal., has been consolidated with the Golden Gate Brick Company, with Mr. C. F. Pratt as manager. The Stockton Brick Company was organized soon after the earthquake in 1906, with Mr. James W. Hislop, for many years with Gladding-McBean and later with Carnegie Brick & Terra Cotta Company, as superintendent. Mr. Hislop will continue to act as superintendent of the Stockton plant. Recent contracts filled by the Stockton company include the handsome mottled glazed brick in the Lincoln Realty building at Fifth and Market streets, San Francisco, the light wells in the Magnin building and the handsome buff and cream brick in the New Y. M. C. A. building at Stockton, Walter King, architect. The consolidated offices will be at 660 Market street, San Francisco.

Los Angeles Shipping Many Brick.

The Los Angeles Pressed Brick Company is shipping 1,500,000 paving brick to be used in the city of Portland, Or. They have to be crated and the buyers furnish the crates and do the crating. They are shipped from the plant to the long wharf at Santa Monica and there transferred to ship. This is the reason for crating them. They have to be swung by a crane from the wharf and let down into the hold of the ship, which would not wait long enough to have an immense lot of the brick lifted by hand.

The same company is shipping street-paving brick to San Francisco because they are needed there in a hurry, and the local plants cannot furnish them. Further orders are expected from San Francisco, which will probably run the amount up into hundreds of thousands.

Pumping Station Completed.

The pumping station at Willows, on the shore of Lake Merritt, Oakland, has been completed and accepted by the city officials. The Healy-Tibbetts Construction Co. were the builders.

The buidling is of steel and concrete, with tile roof, and its completion marks the welding of another link in the chain of public buildings in Oakland, which embody the ideas of a Board of City Officials that is thoroughly alive to the necessity of a general plan which shall make for a harmonious building of a city.

An Index to the Advertisements

[Index continued on Page 120.]

A New Heater.

It will interest the building fraternity to learn that a new firm has been formed to carry on the business of manufacturing water heaters and combination gas-heating boilers in Oakland.

The company, organized with A. W. Kennedy, a local capitalist, as business manager, and Mr. Charles Hart, the inventor, as superintendent, has secured quarters for their manufacturing plant at 525 Seventh street, Oakland, the brick building that was formerly used as a candy factor. The Hart Heater Company will make The Queen water heater and The Hart combination hot-water boiler, which are the result of many years of experiment on the part of the inventor, Mr. Hart.

The system of heating is through copper coils, four in number, and thirty-four feet in length, each coil having a separate connection at top and bottom with brass tees, and doing away with the trouble and expense incident to clogging and corroding, so common in other heaters. A new feature of construction is that the coils are the same at both ends, and may be inverted, if desired, thus making a practically new heater.

The jackets are lined with asbestos, and can easily be raised from the coils, for cleaning purposes.

Mr. Hart claims for his water boiler that it is the quickest and most economical one that has ever been put on the market. The boiler is made in three sizes 18, 24 and 30 gallons, and the builder who is interested in heating would do well to call at the factory and investigate the claims of the inventor.

Los Angeles Firm Busy.

The Machinery and Electrical Company, 351-353 North Main street, Los Angeles, report among their latest contracts one to supply and erect five 600-horse-power duplex pumping engines for the Union Oil Company. The engines will be installed at various points between Los Angeles and Bakersfield. They will also install forty Scotch marine boilers, of 150 horse-power each, for the same company. These two contracts amount to $250,000, and the work will be completed in six months.

The same company will install the heating system in the American National Bank building of San Diego; F. P. Burnham of Los Angeles, architect.

They also have the contract for the installation of the blast heating system in the Grand Hotel, San Diego; the heating plant of Throop Polytechnic Institute, Pasadena, and the heating plant for the home of Henry E. Huntington at Oneonta Park, Hunt & Grey, architects.

The company has also secured the contract for the heating plant to be installed in the Territorial Prison at Florence, Ariz.; Thornton Fitzhugh, architect.

"Modern Wood Finishing."

One of the most complete, practical and interesting hand books on wood finishing is "Modern Wood Finishing," issued by the Bridgeport Wood Finishing Company, New Milford, Conn.

This booklet illustrates in colors and describes various popular finishes obtained by the use of Bridgeport Standard Wood Finishing Products, which line enjoys the reputation of being the stand-

ADVERTISERS' INDEX—Continue from Page 117

ard on the market, representing the most advanced ideas in the art of wood finishing, together with the latest and most artistic effects.

That this booklet is a popular work of reference with architects, builders, painters and property owners is attested to by the fact that two editions have already been issued. The company will gladly mail a copy to all making application as long as the present edition lasts.

As many of our readers know, the Whittier-Coburn Company of Los Angeles and San Francisco are Pacific Coast distributors of the above products and have some beautifully finished samples on hand.

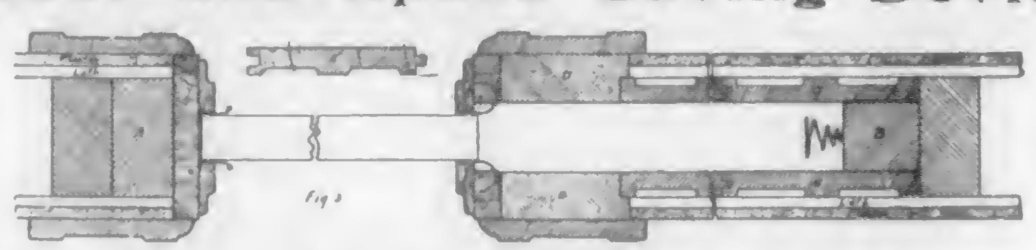
Palo Alto Municipal Improvements.

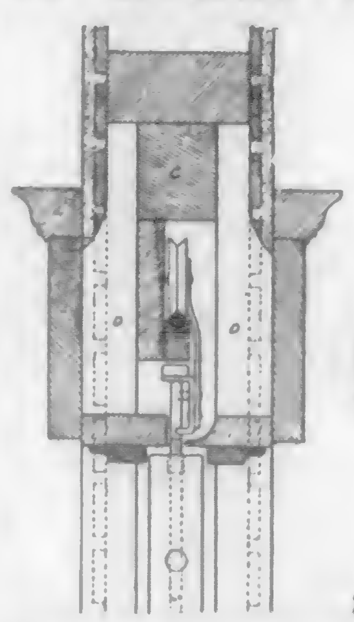
At a special election held by the citizens of Palo Alto it was voted to bond the city for the following municipal improvements: For a reinforced concrete building for municipal water plant, $8,000; steel water tanks for fire protection, $7,000; street lighting, $3,500; fire-alarm telegraph system, $3,500. The improvements are to be made as soon as the bonds are sold.

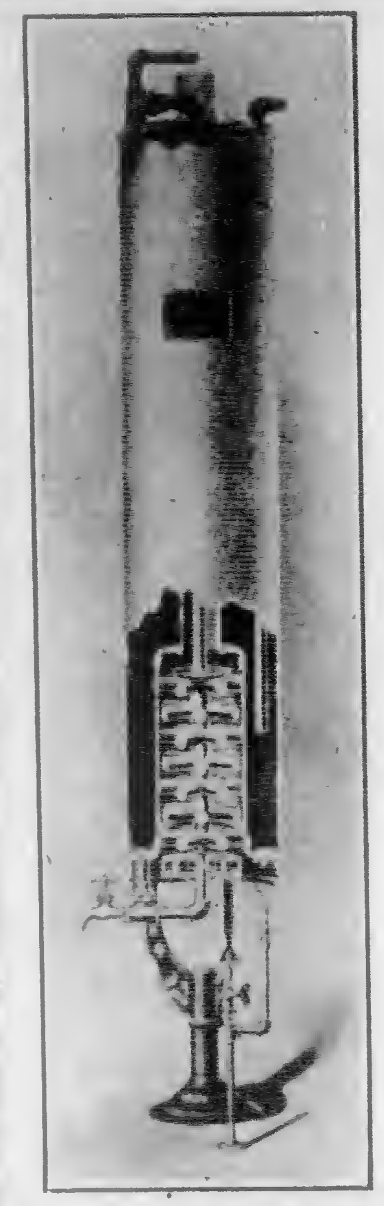
May Meet in California

The next annual convention of the American Institute of Architects may be held in Los Angeles. It has been practically decided that the session next year will be held in the Southwest, unless it is decided definitely to hold all conventions hereafter in the National capital.

Under the present policy, each alternate convention meets in Washington, the intervening conventions being held wheresoever the committee in charge wills.







The Everlasting Valve.

A recent invention, which is attracting the attention of the plumbing fraternity, is a valve made by the California Valve and Air Brake Company of San Francisco.

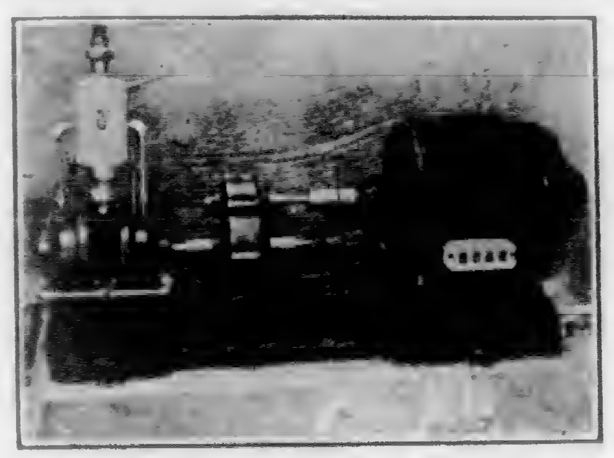
The inventor has succeeded in eliminating the perishable element in valve construction. There is no wear—no giving out of parts—hence, the trouble and expense incidental to repairs are eliminated. There are no gaskets, no packing, for the pressure packs the valve, no springs, no regrinding. Absolute evenness of contact between plug and seat,—in short, a near approach to perfection.

The dealer, or the owner, who has experienced the variety of troubles that have always, heretofore, attended the use of valves, can appreciate the value of this invention which cannot leak or wear out.

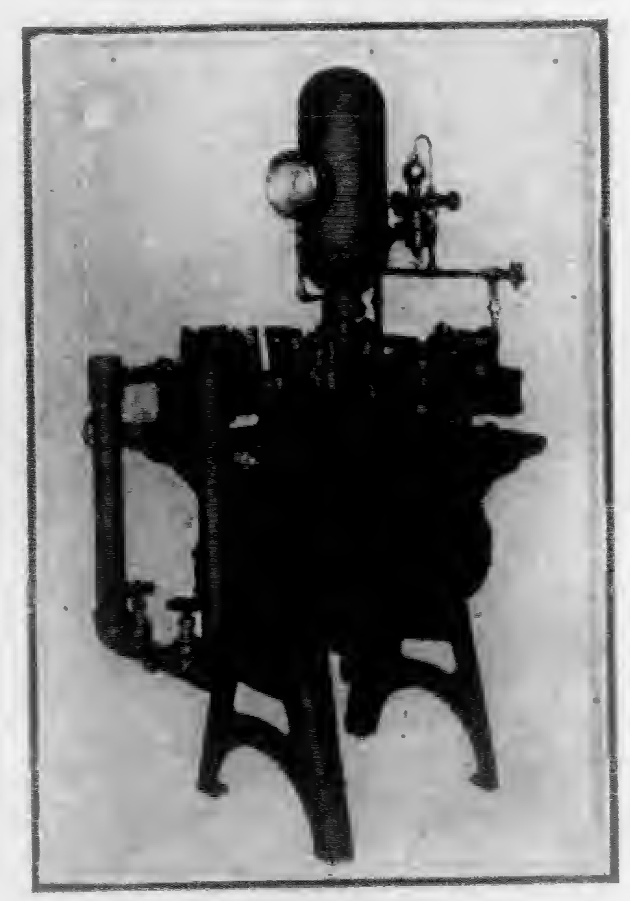
The line of goods now being placed on the market includes valves for water, steam, air, gas, ammonia, and oil,—valves for elevators, pressure regulators, pilot valves, automatic boiler feed valves, etc. Simplicity of construction and simplicity of operation are combined.

For example, in the hot and cold blending valve, the first movement of the handle yields a flow of cold water. Continuing the movement yields any desired degree of heat until hot water is secured. Under the old system, two









faucets were necessary. The company has even designed a special valve for salt water use.

But the advantages afforded are so great that it needs but to be seen in operation to convince the beholder that the new valve is the ne plus ultra of its kind.

The company's main office is at 703 Monadnock building, San Francisco. Branches will be established in all principal cities.

The valve is being manipulated by W. T. Garratt & Co. of San Francisco.

Contractor King Completes Two Good Jobs.

Charles King & Co., contractors and builders, with an office in the Pacific building, San Francisco, have recently finished two contracts for Architects Reid Brothers, which are a credit to both designers and builders. One of these buildings is a two-story frame, having four flats, each with its private entrance. The building is at the corner of Larkin and Washington streets, and the owner is Mary A. Gannon. Each apartment has five and six rooms, with all modern conveniences, and the interior finish is in imitation Flemish oak.

The other building is on Fourth Street, between Mission and Howard streets, and is a two-story brick, 34 by 116 feet, with an L 22 by 34 feet. The building was put up in eighty working days. It contains offices and warerooms for the Western Butchers' Supply Company. The building is equipped with cold storage and Van Emon elevators. It cost $20,000.

Butte Company Reorganizes.

The partnership interests of Messrs. Arthur B. Lebenbaum and Edwin B. Pike of the Butte Engineering and Electric Company, have been purchased by Messrs. P. C. Butte and C. F. Butte and the business of the new co-partnership will be continued under the original name of the Butte Engineering and Electric Company.

Mr. C. F. Butte, who will take active part in the future business of the Butte Engineering and Electric Company, is well known in the electrical field and has had an experience extending over twelve years of active practical and technical work.

The reputation of Mr. P. C. Butte in the Electrical field needs no comment and with the combination of the experience of the two partners and their thorough working organization, the Butte Engineering and Electric Company is now in a splendid position to handle electrical work of any magnitude.



Showing Holmes Beds in Place, Closed. Casa Rosa Apartments, Oakland



Showing Holmes Beds Open and Ready for Use. Casa Rosa Apartments, Oakland.

The Holmes Disappearing Bed.

The above cuts illustrate one of the apartments in the Casa Rosa Apartment House, showing the Holmes Patent Disappearing Beds used in conjunction with a writing desk in the living room and a buffet in the dining room.

The Holmes Disappearing Bed is contained in a thoroughly ventilated galvanized iron recess. The process of ventilation is simple, but very effective.

The bed can be drawn from the recess and placed wherever desired, and quite as easily as moving a chair.

These beds were first placed on the market within the past three years, yet owing to their rapid growing popularity, many of the most important hotels and apartment houses on the coast have been equipped with them. The beds have always proven a drawing card wherever installed.

The Holmes Disappearing Bed **is not a wall bed, not a folding bed,** and occupies no valuable space.

The beds can be seen in practical operation at the show rooms of the Holmes Disappearing Bed Co., No. 687 Monadnock building, San Francisco, California.

Asbestos Protected Metal.

There has long been a demand for a light building material which will resist rust and render permanent service in the construction of railroad and factory buildings, warehouses, grain elevators, automobile garages, etc. Iron and sheet steel have for generations past been most used for this purpose, but their liability to rust and corrosion, and the constant repainting necessary to render them serviceable, make them unsatisfactory. Slate, tiles and tar and gravel are largely employed in roofing buildings of various classes, but their extreme weight necessitates a very stout construction of roof framing, with consequent expense. In the case of tar and gravel roofing, which is largely composed of highly inflammable material, the fire menace is an important item to be considered. There are many kinds of portable ready roofings, but they are not of a permanent character and for high class buildings are not popular. Asbestos protected metal possesses all the good points of every kind of roofing and siding heretofore used, at the same time it has none of the defects so apparent in these other materials which have caused tremendous damage to property and enormous expenditure for repairs.

Asbestos protected metal is composed of a core of sheet steel hermetically



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Asbestos protected metal is composed of a core of sheet steel hermetically

sealed within a heavy coating of cement compound, in which is embedded on both sides of the sheet pure asbestos felt.

The steel core, which is the strongest feature of Asbestos Protected Metal, is absolutely protected and is immune to attack of any natural agent, whether it be used on the exterior or interior of a structure. The most severe climatic conditions will have no effect upon it, as the coating is perfect. The cement coating is itself protected by the pure asbestos felt, with which it is covered on both sides of the sheet. The result is a material which will resist fire, water, gases, sulphur fumes and the ravages of the elements for an indefinite period. It possesses the strength, rigidity and lightness of sheet iron combined with the portability and ease of application of the most satisfactory of the ready-prepared roofings.

Asbestos-protected metal possesses lasting qualities which have hitherto been unknown in a covering or light building material of any nature. As a roofing or siding it is unrivalled. The condensation on the inner surface, which is the most vulnerable point of an ordinary metal roof, is practically eliminated.

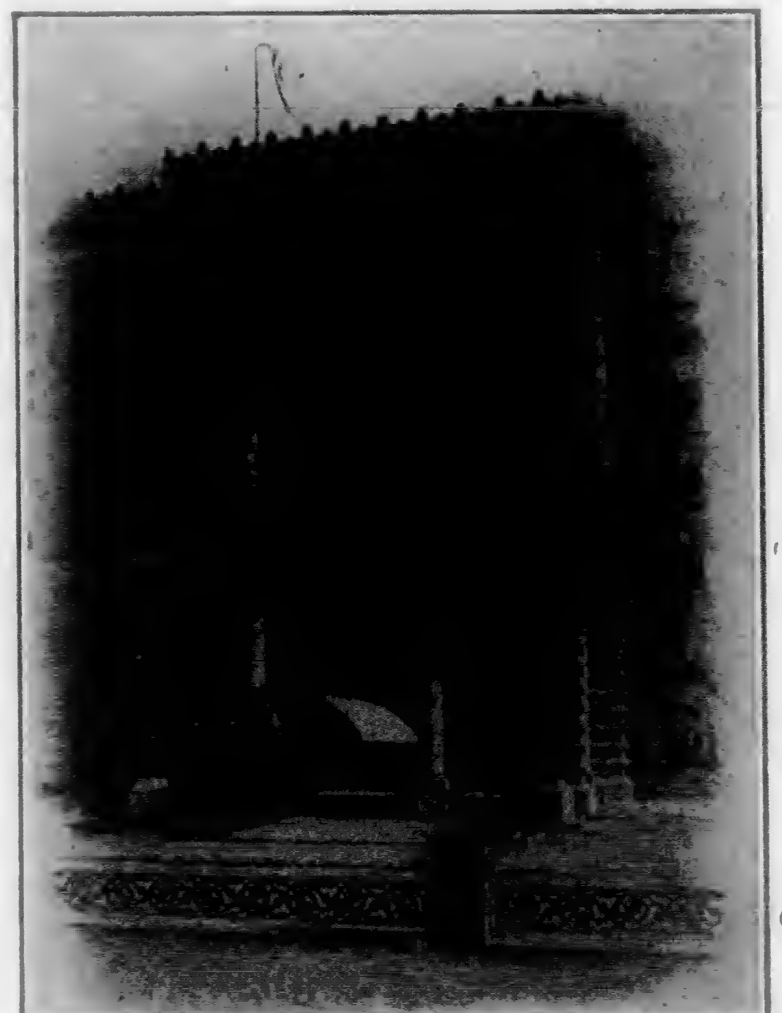
For interior service this material can be finished in a very attractive manner. Solid colors as well as imitation wood effects are obtainable. The sheets may be easily shaped or cut in panel form and used for ceilings, side walls, etc. It is damp-proof, vermin-proof and permanent.

Asbestos-protected metal will stand a very great heat without drawing or buckling, and buildings constructed of it or covered with it are protected from destruction by fire in adjoining property. A fire in a building, the roof or sides of which are asbestos-protected metal, will be confined thereto, owing to perfect insulation, as the sheets, if tightly and properly fastened, allow no vent for the flames.

Asbestos-protected metal is stronger than any other roofing or siding material of equal weight. In the covering of structures for manufacturing or other commercial purposes this is a most important item.

Asbestos-protected metal is easy and economical to apply and attractive in appearance, a thoroughly tested article which has been tried out under all conditions of service and approved by the best architects, engineers and insurance men in various parts of the country.

The metal is manufactured by the Asbestos Protected Metal Company, of Canton, Mass. P. J. Knudsen Company, 310 California Street, San Francisco, Cal., sole agents for Pacific Coast.





Competition for Design for A Boat House.

The competition to be open only to architectural students, whether in architects' offices or in colleges, in California, Oregon, Washington, Nevada and Utah.

No architect may compete.

The Architect and Engineer shall have the exclusive privilege of publishing any or all designs submitted.

Situation:

Boat house to be on the Twelfth street boulevard, Oakland, on the north side of the street, which is filled or "made land," and incloses an arm of the bay which is called Lake Merritt; the boat house is to face Peralta Park on the south, which park is now being graded. The building, of fireproof construction (reinforced concrete), to rest upon concrete piles. The exterior design and arrangement is to be left to the competitors, the committee only requiring that the building be of two stories, with gallery or balcony on upper story, and that provision be made for an office, men's and women's dressing rooms, repair shop, lockers, lunch room, spacious lounging room, large float with stairs leading from float to first story of boat house; provision should also be made for flag poles, or other arrangements for displaying flags; also for living rooms, on the upper story, for the family of the boat house keeper. The length of the building, east to west, must not exceed 450 feet. The cost of the building should be inside of $100,000.

Drawings:

To be made on a scale of one-eighth inch to one foot, on white Whatman paper, and to consist of:

Foundation plan,
First floor plan,
Second floor plan,
Section through building,
Four elevations, all in black ink, and no coloring.

Perspectives, while not required, will be used for reproduction if they possess merit.

The designs will be considered by a Board of Judges, to consist of Mayor Frank Mott of Oakland, California, Messrs. Walter G. Manuel, W. S. Gould and Jas. P. Edoff, who constitute the Board of Park Commissioners of Oakland, and some authorized representative of The Architect and Engineer.

Prizes:

Five prizes will be awarded as follows:

For the best design, a Bostrom level, value $25.

For the second best design, a set of K. & E. drawing instruments, value $15.



For the third best design, a set of scale rules, in case, value $10.

For the fourth best design, a set of triangles, value $7.50.

For the fifth best design, a Ferguson fountain drawing pen, value $5.

Requirements:

The design must be delivered personally or forwarded by mail, prepaid, addressed to "Competition Editor," The Architect and Engineer, 621 Monadnock Bldg., San Francisco, Cal., and must be received at this office not later than October 15, 1909. They should be signed by a nom de plume. Details are not necessary.

Newman's College.

San Francisco has always been famous for the magnificence of its cafes, but there was recently opened, at the junction of Powell and Eddy streets, "Newman's College," which, in point of elaborate fittings and decoration, eclipses all previous undertakings, and is second to none in the United States.

The cafe is in the Techau Tavern building, and occupies a small space, yet in the architectural design, as carried out by the various contractors, every inch of space has been utilized to the best advantage, so that the observer wonders how so much can be contained in so little.

The main entrance to the cafe, at Powell and Eddy streets, is not so wide as it should be, but land values in San Francisco are now so high that the business man must content himself with a narrow frontage. In times gone by, it was the custom to say that the Easterner came West to broaden out, but that was before the San Francisco real estate agent went daft, following the earthquake and fire; now, the Westerner finds it necessary to conform to the Eastern custom, and narrow down.

The visitor to Newman's College finds so much to admire, in the harmony of color, the brilliancy of the lights, the mural decorations, the beautiful statuary, that he is moved to ask:

"By whom was this designed?"

From the basement floor to the ceiling of the mezzanine floor, everything within the walls is the design of the owner, Mr. Charles Newman, who has attained to fame, not as an architectural designer, but as a caterer, and, during his absence on an Eastern trip, his design was faithfully executed, under the supervision of Mr. Charles L. Taylor, of the firm of Taylor & Johnson.

The floor of the cafe is of tile, laid in squares, pale green in color, with a pattern of large size California poppies, in their natural color.

The walls and the ceiling form the most attractive feature of the architectural design, and have been treated in a manner that does credit to the decorators. The ceiling is decorated in hammered metal effect, with gold leaf. When it is considered that fourteen hundred dollars worth of gold leaf was used on the ceiling, and that five weeks' labor of three men was given to the work, the reader may be able to form an estimate of the elaborateness of this part of the decorative scheme.

The walls are covered with mural paintings, depicting scenes in college athletics, and include the sprinter, the hurdler, the boxer, the football player, and others. Over the front end of the bar is a painting of the Stadium, at the University of California, while over the Eddy street entrance is a picture of Mr. Newman's famous dog, Lester C. Dewey, champion St. Bernard of the world.

The mural decorations are the work of The Geo. F. Neece Company of Oakland, and are eliciting many encomiums from visitors.

The art glass decorations were installed by the Munich Art Glass Company of San Francisco, and are beautiful specimens of art work in glass.

The bar fixtures are elaborate, and Mr. Newman has incorporated several original conveniences in the construction, which are appreciated by the patrons of the cafe.

Some beautiful specimens of statuary add to the pleasing effect, and on every side are evidences of good taste.

Over the bar are displayed the colors of every important college in the United States, so that the visitor, be he from the north, the south, the east, the west, will see the colors of his Alma Mater.

The basement is fitted up with a kitchen, store-rooms, a Presidential room, dressing rooms, etc., which are finished in white tile, floors, walls and ceiling. The most interesting feature of the lower floor is the "Bust Room," which is situated under the Powell street sidewalk. This room is intended for the use of college fraternities, and is furnished for their especial use. The tables and the chairs are of massive construction, and are chained to the floor. The knives and forks are of heavy pewter, and they are chained to the tables. The room is furnished in rustic redwood, with the bark on, and is well lighted, by day and by night.

Considered as a whole, "Newman's College" is the most original, in its general design, of any cafe in San Francisco, and will be one of the points of interest to be visited by the tourist, whether he be a college man or a man of ordinary attainments.

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San Rafael Golf and Country Club

The Work of Frederick H. Meyer, Architect

With a Brief Introductory on Office Building Construction by Mr. Meyer

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It was not long, however, before the investor realized that tall office buildings, economically constructed and carefully planned for light and the requirements of the various tenants, would pay a satisfactory rate of interest with the added advantage over the old type of being practically fireproof and with a minimum of deterioration.

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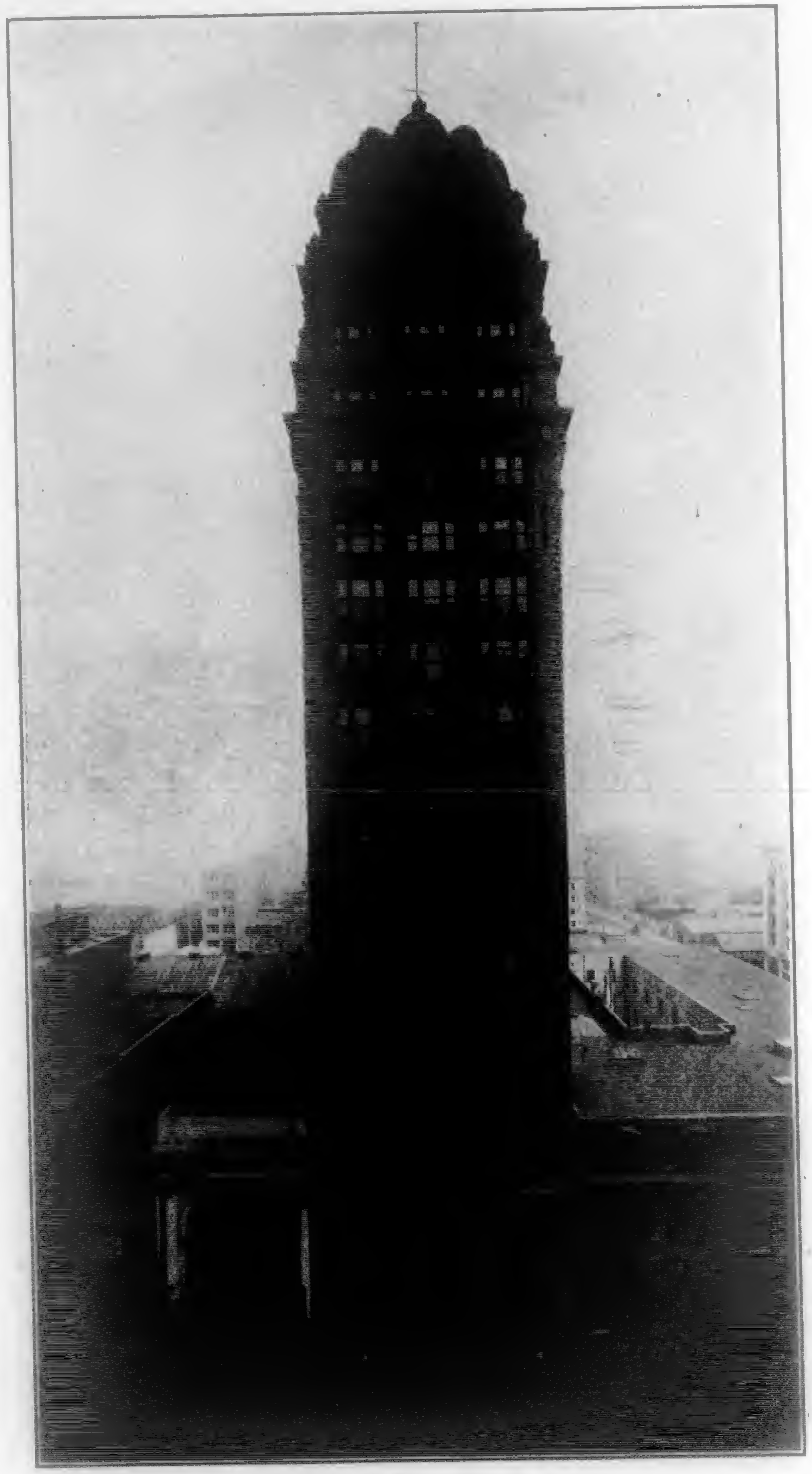


Humboldt Bank Building, San Francisco
Frederick H. Meyer and Smith O'Brien, Architects Louis A. Hicks Company, Builders



Entrance to Humboldt Bank Building

he had just returned from an extensive trip throughout the East and had chanced upon a novel idea in the planning of rooms which had been used successfully in a small office building in Chicago. The corridors were placed at least twenty-five feet from the outer walls, so that wherever a room faced a street frontage it was twenty-five feet in depth. The column center in the opposite direction was made as great as permissible with economical construction. The window openings on the exterior were numerous and in all cases were provided with a wood or brick mullion wide enough to receive a dividing partition. A room twenty by twenty-five feet could be divided into three compartments—a reception room, eleven by twenty feet, and two offices facing the street, ten by fourteen feet. A prospective tenant would readily pay seventy-five dollars for an arrangement of this kind, whereas he would object seriously to paying fifty dollars for a single room. It is astonishing, the variety of division that can be made to comply with almost any requirement.



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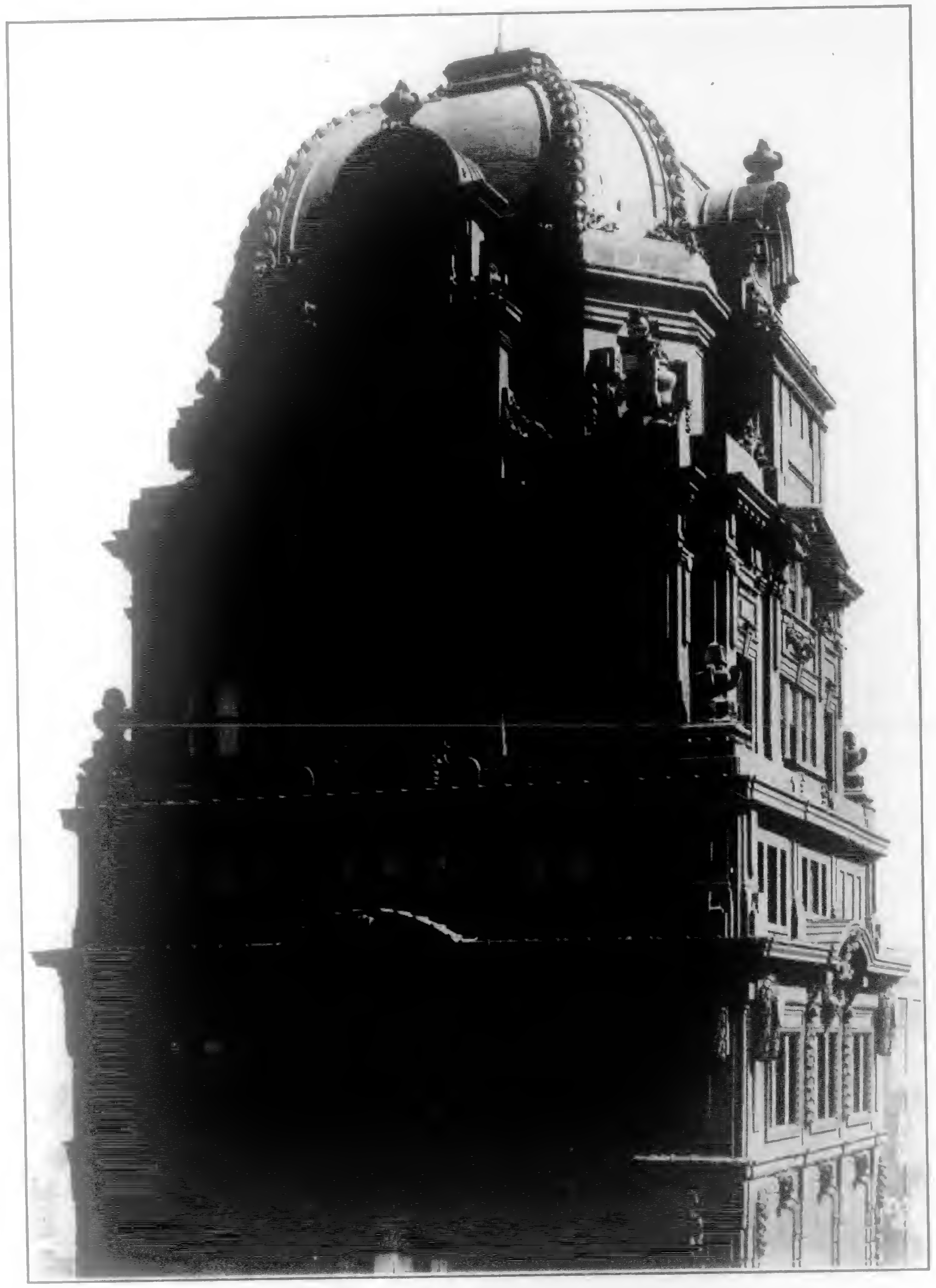
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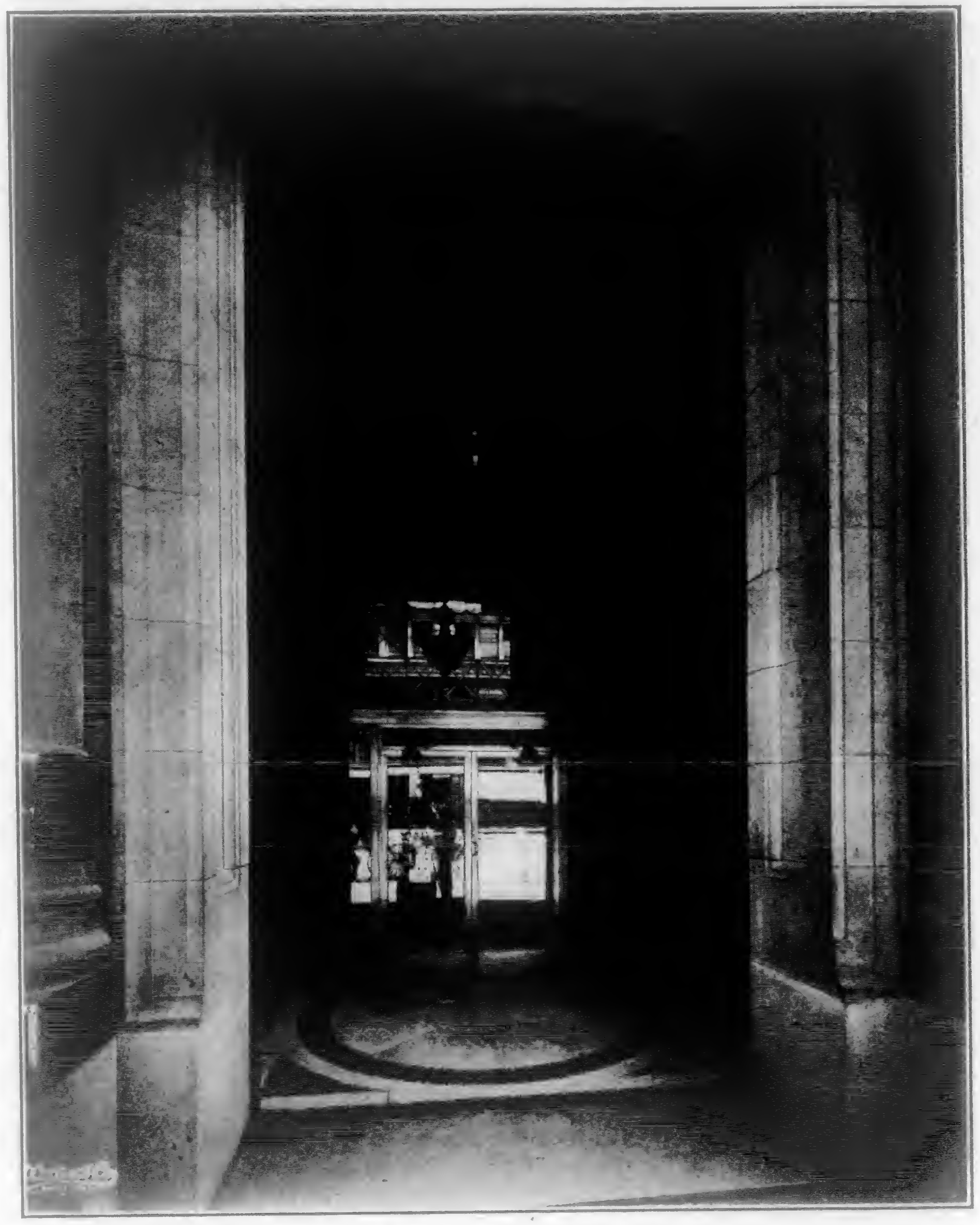
Detail of Tower, Humboldt Bank Building, San Francisco



Entrance Vestibule, Humboldt Bank Building, San Francisco



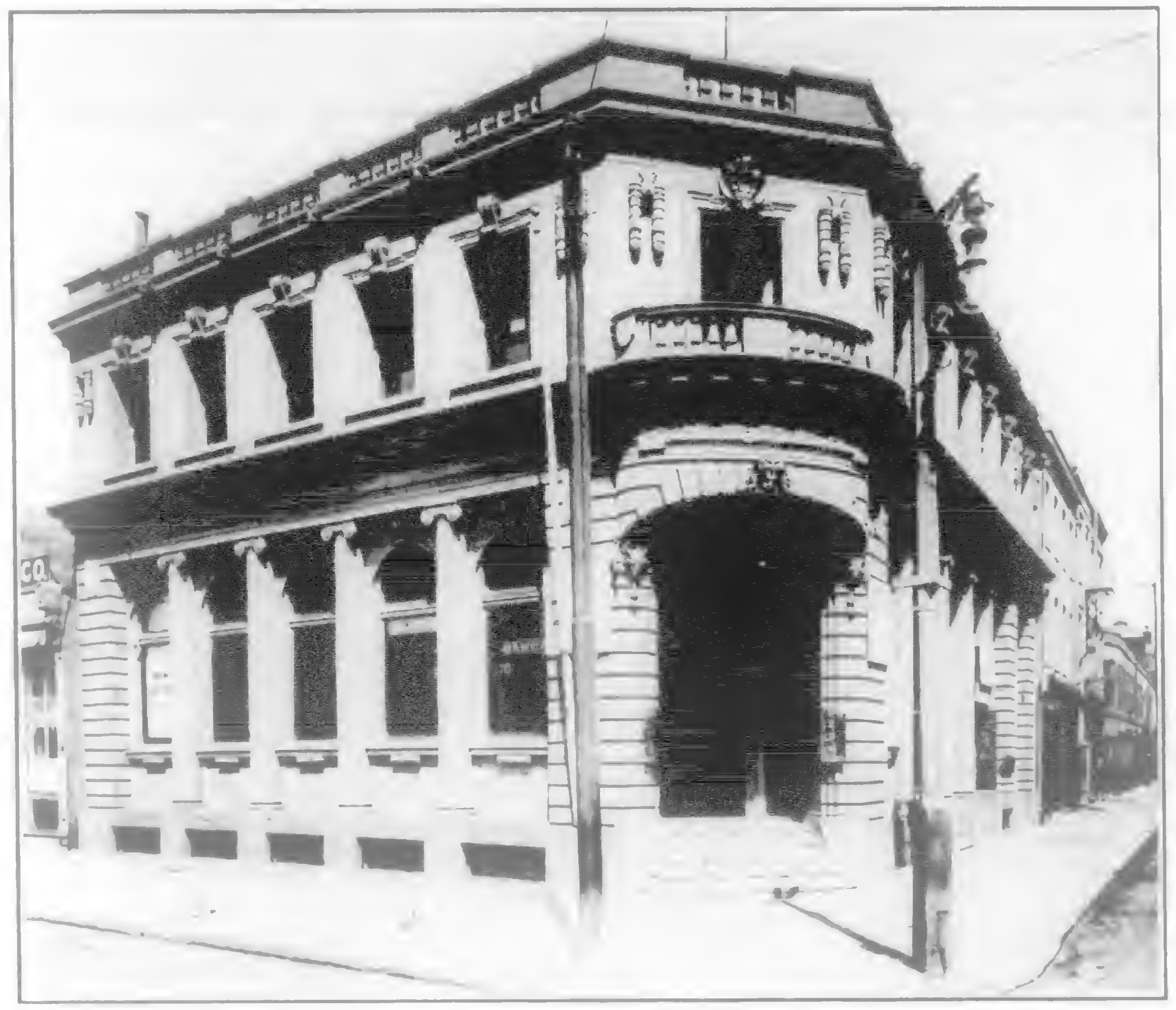
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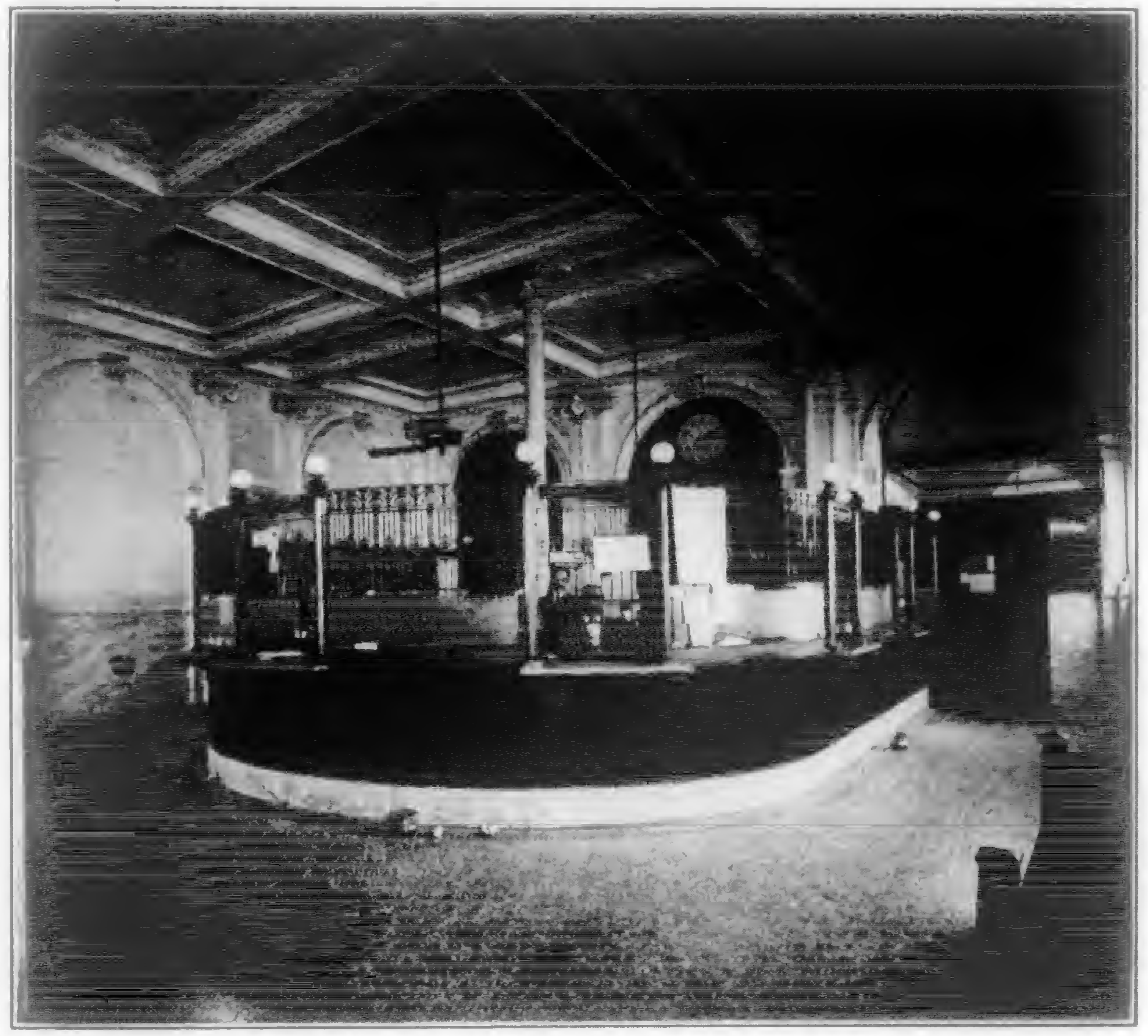
Banking Room, Humboldt Bank Building



Columbus Savings Bank, San Francisco



Bank of Bakersfield



Interior Bank of Bakersfield



Banking Room, Humboldt Bank Building



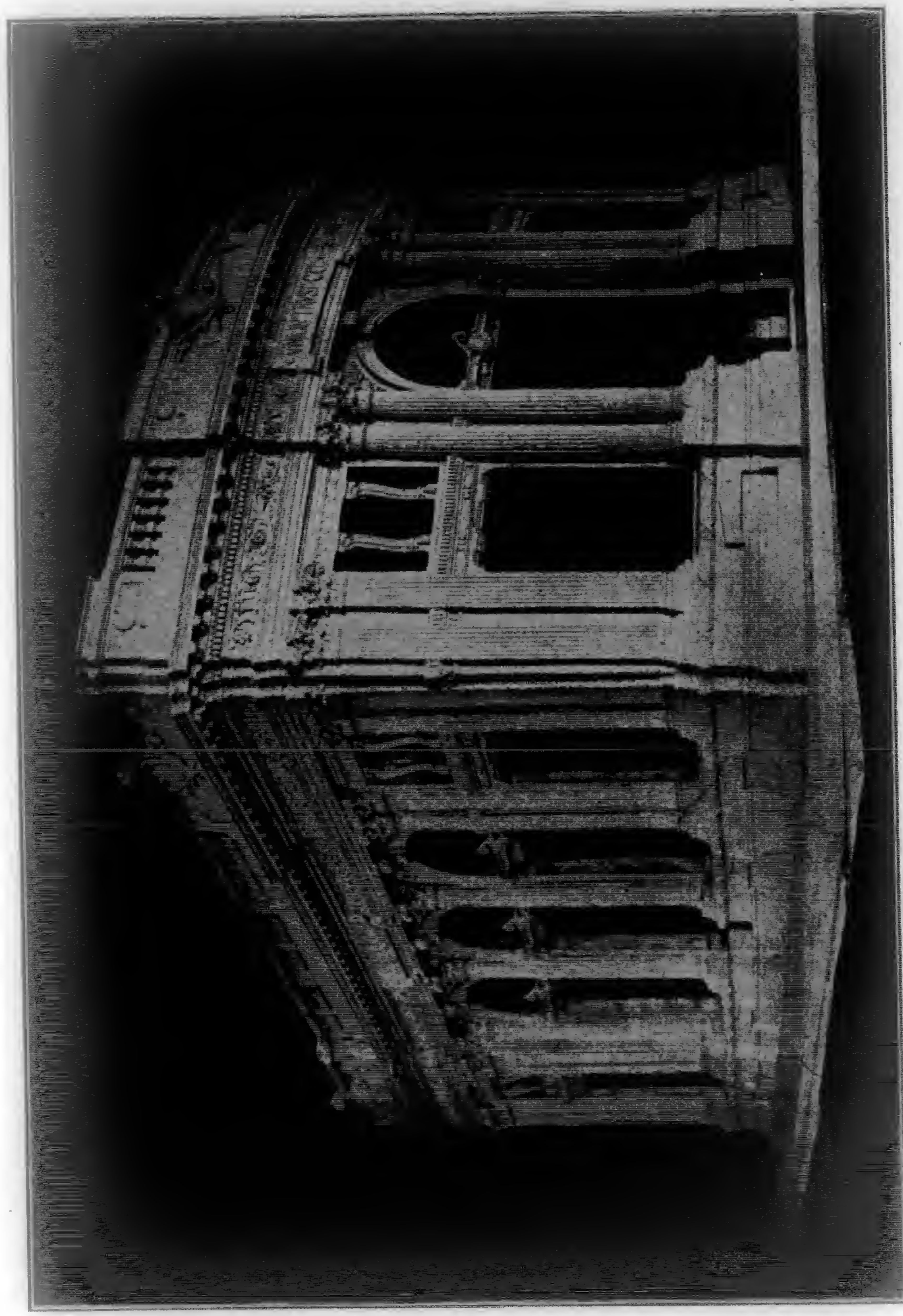
Columbus Savings Bank, San Francisco



Bank of Bakersfield

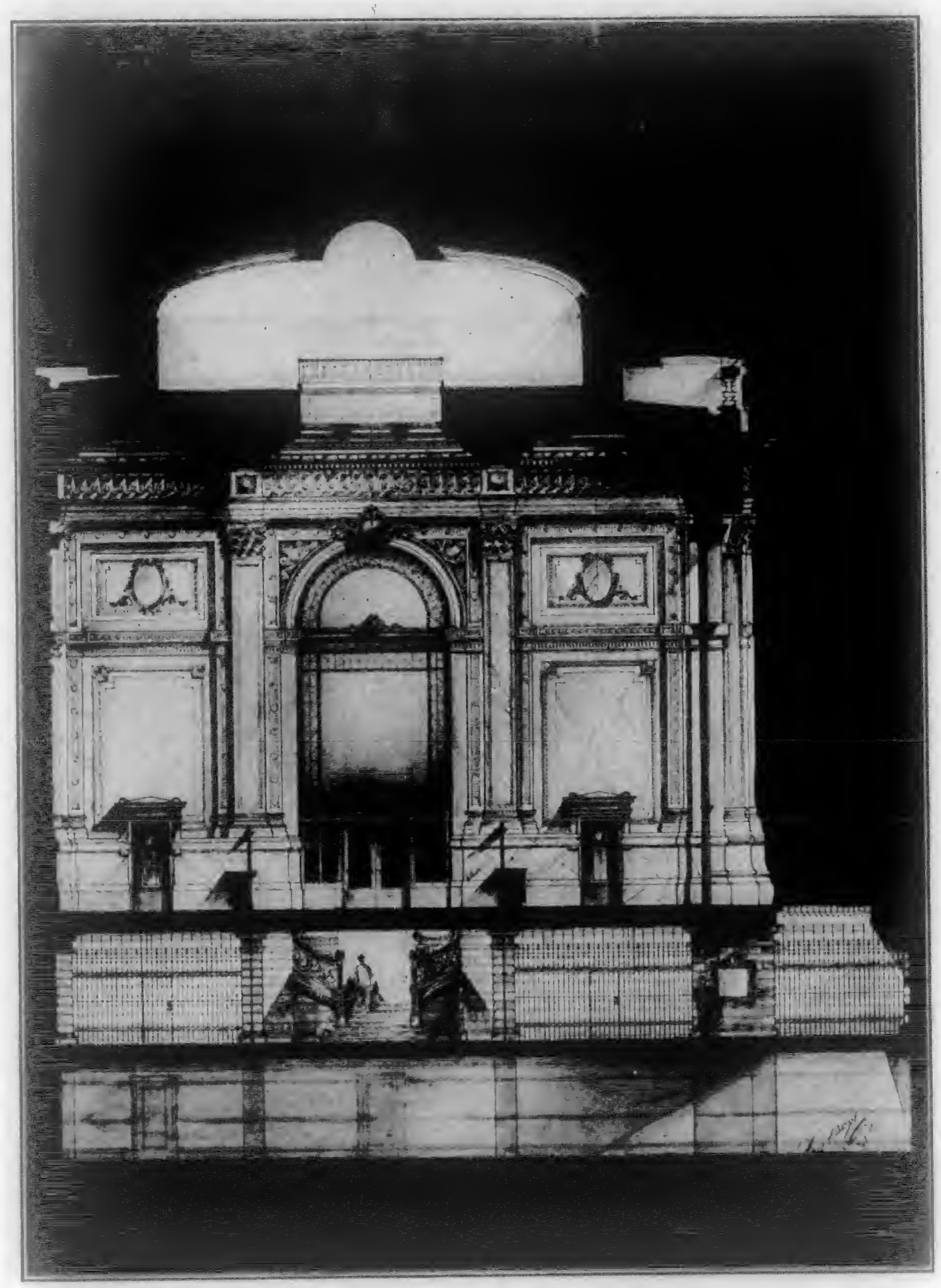


Interior Bank of Bakersfield



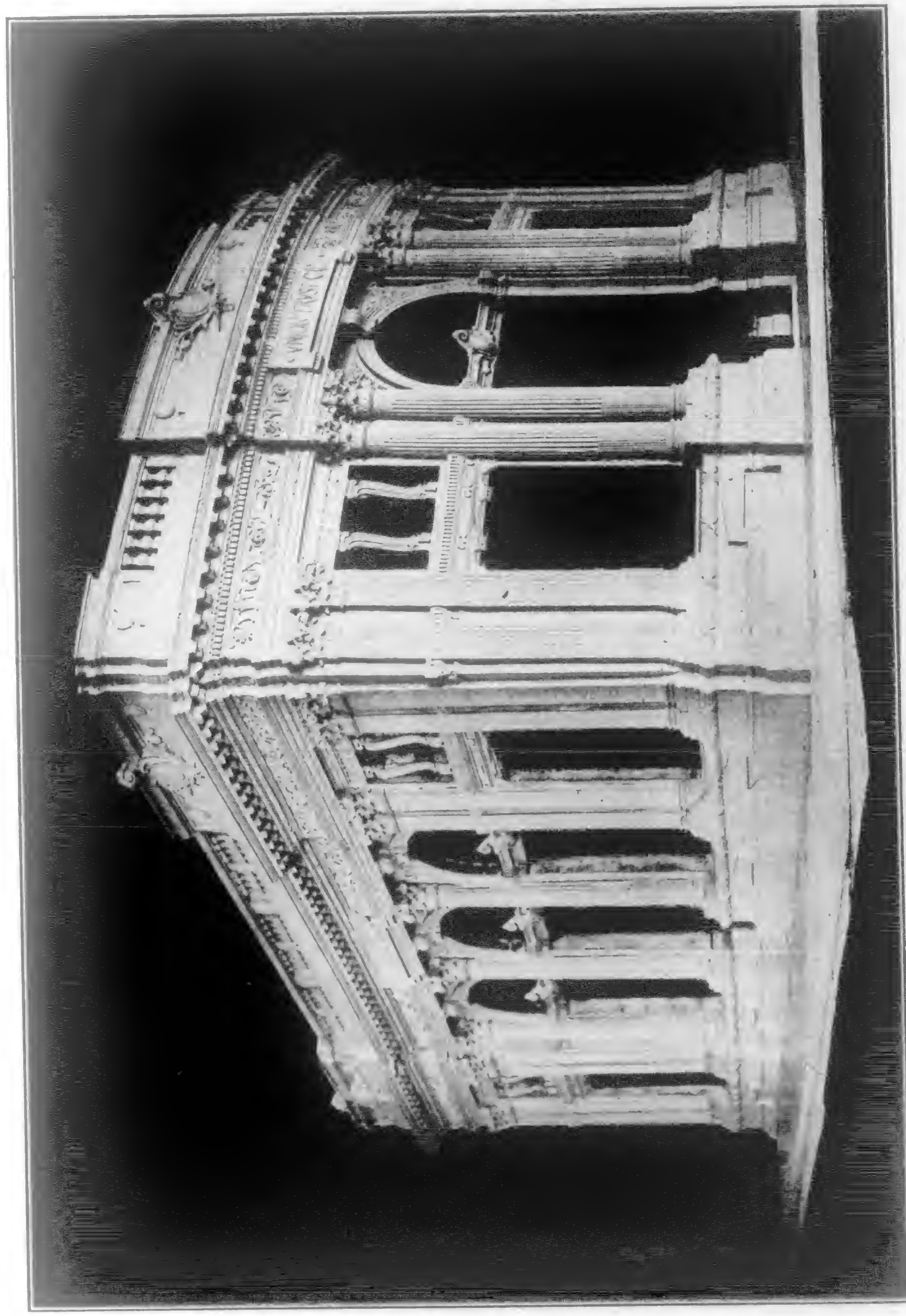
Competitive Design of Union Trust Building, San Francisco

Frederick H. Meyer, Architect



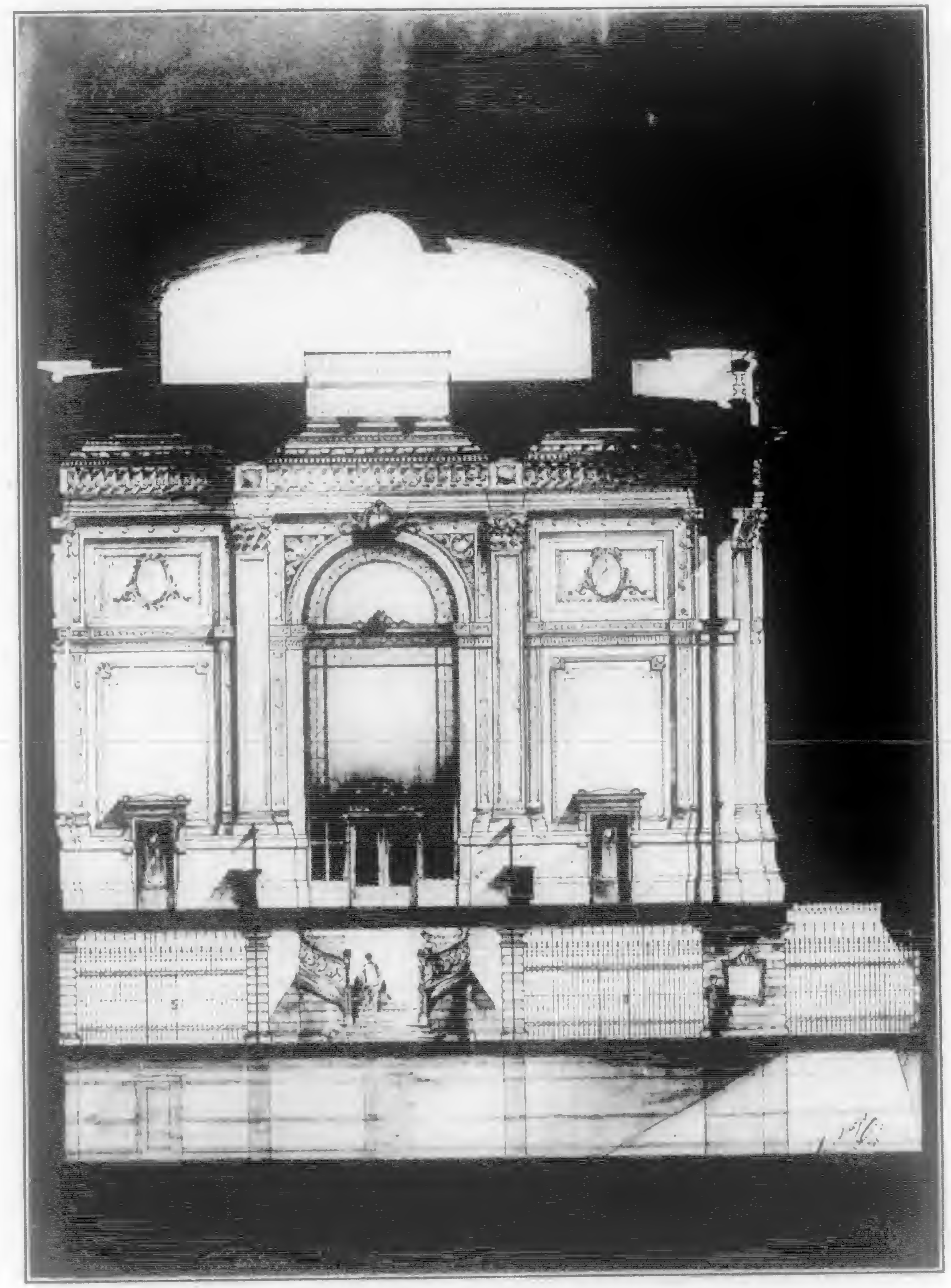
Competitive Design, Interior Union Trust Building

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Competitive Design of Union Trust Building, San Francisco

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Competitive Design, Interior Union Trust Building

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Marin County Bank
Frederick H. Meyer, Architect



Rialto Building, taken before the fire in 1906



Crossley Building, San Francisco, taken before the fire, 1906

This same arrangement was successfully carried out in the alteration of the original Wells Fargo building, afterwards known as the Crossley. This building had the distinction of being occupied to ninety-five per cent of its capacity within six months after completion.

A disadvantage of this method is that the building may be said to be in an incompleted state until fully occupied. However, the large and immediate return on the investment proved that it was most satisfactory to the average tenant and attracted him to this new section—making Mr. Law's venture a great financial success.

Investors often, in desiring to create a monument to themselves, make the extravagant mistake of filling the basement of a large building with expensive machinery, dynamos, steam boilers, etc., requiring the services of a corps of high-salaried engineers to operate and maintain the equipment. Whereas, an office building plant should be as nearly automatic as possible and operated by a low-salaried man. All the water pumps can be operated by electric motors and controlled by automatic switches, needing but very little care. Steam heat can be furnished by either a high or low-pressure boiler, burning oil—the burner practically automatic—hot water by a gas or oil-burning water heater, and a vacuum sweeper plant, electrically driven. Electric elevators are also preferable. The current for power and lighting can be purchased. This makes a simple and economical plant, representing a small investment and little deterioration.

San Francisco is now so far advanced commercially that some of her office buildings have specialized in their tenantry, many being wholly occupied by doctors and dentists, with special conveniences, such as com-



Marin County Bank
Frederick H. Meyer, Architect



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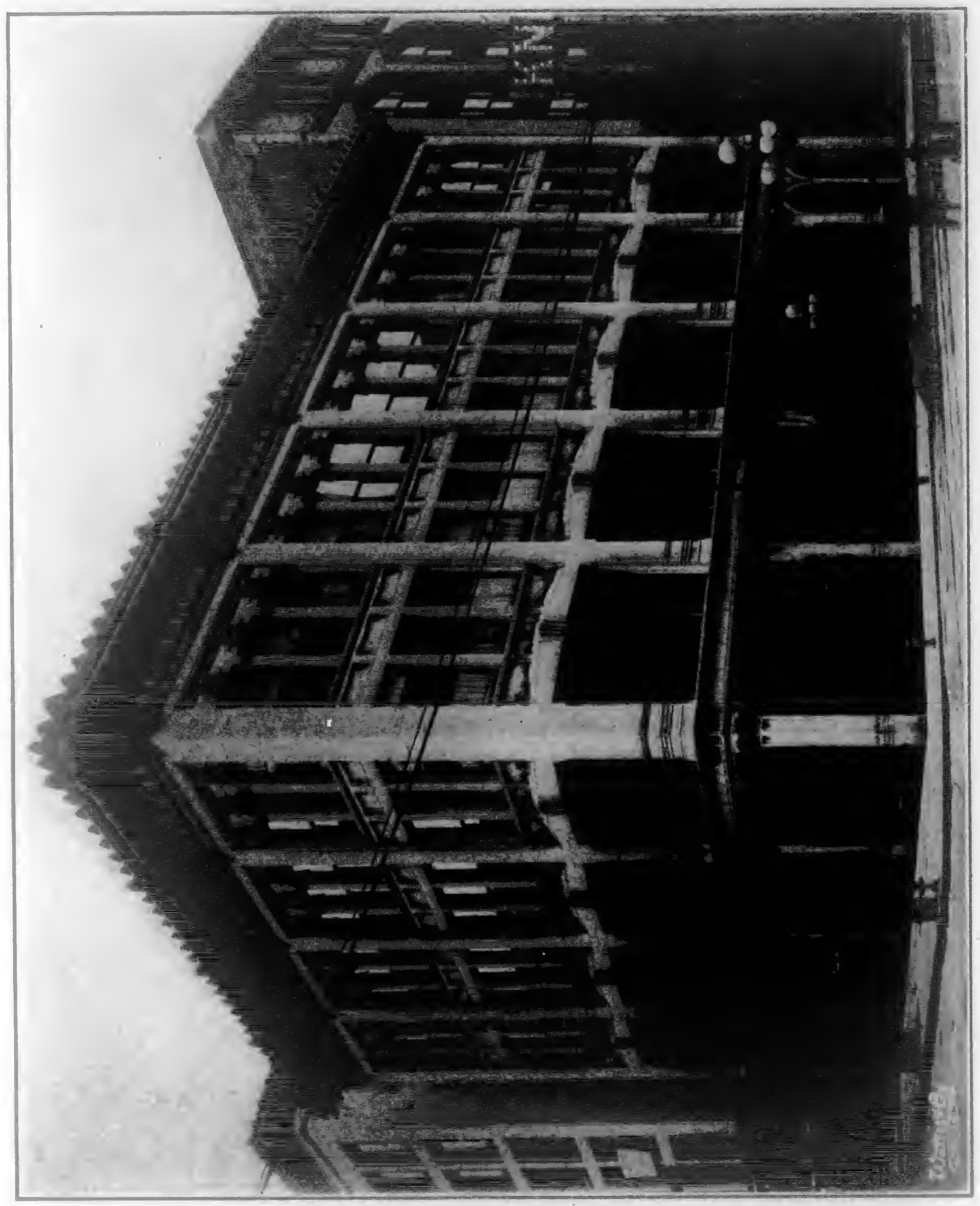
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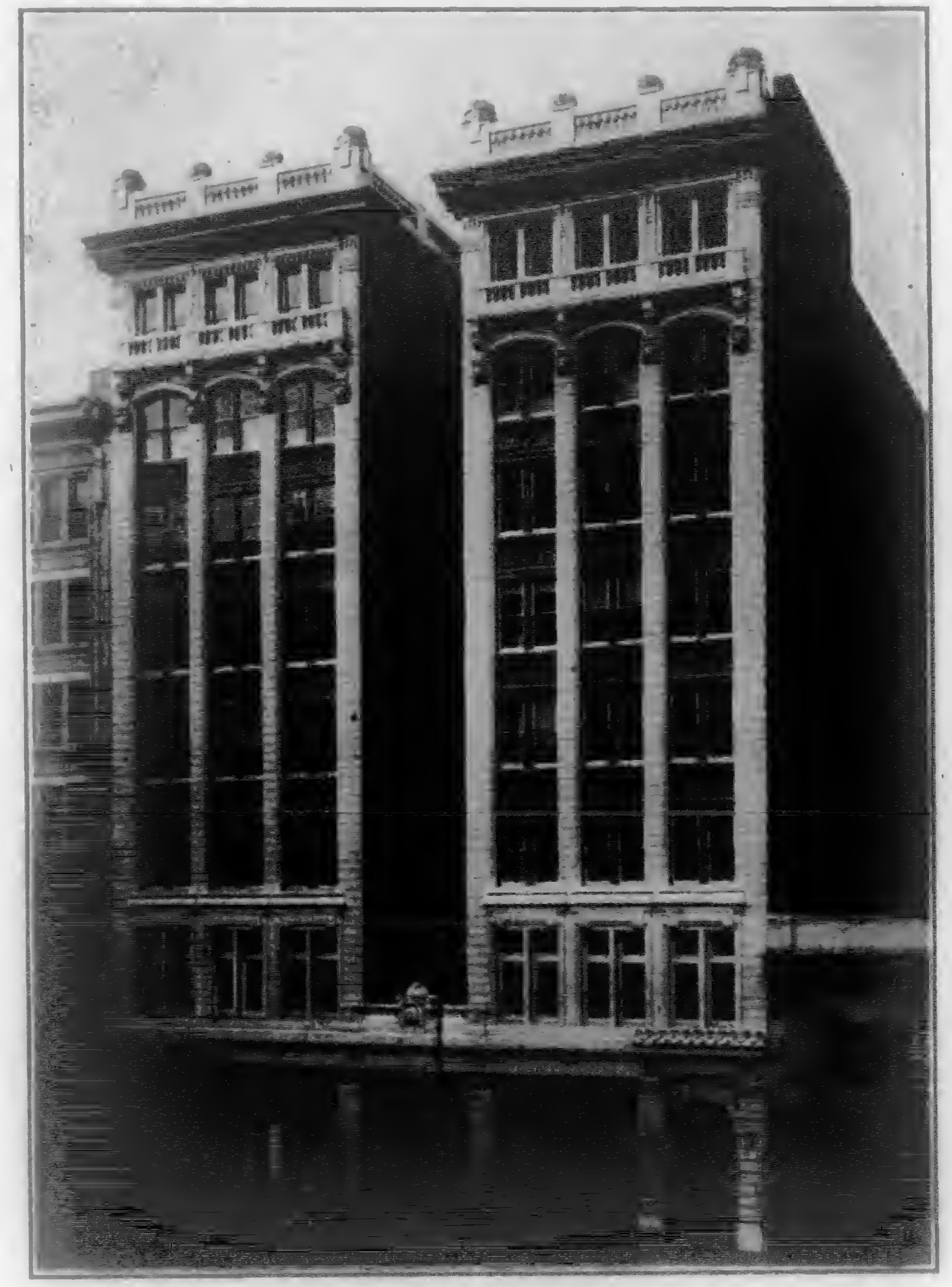
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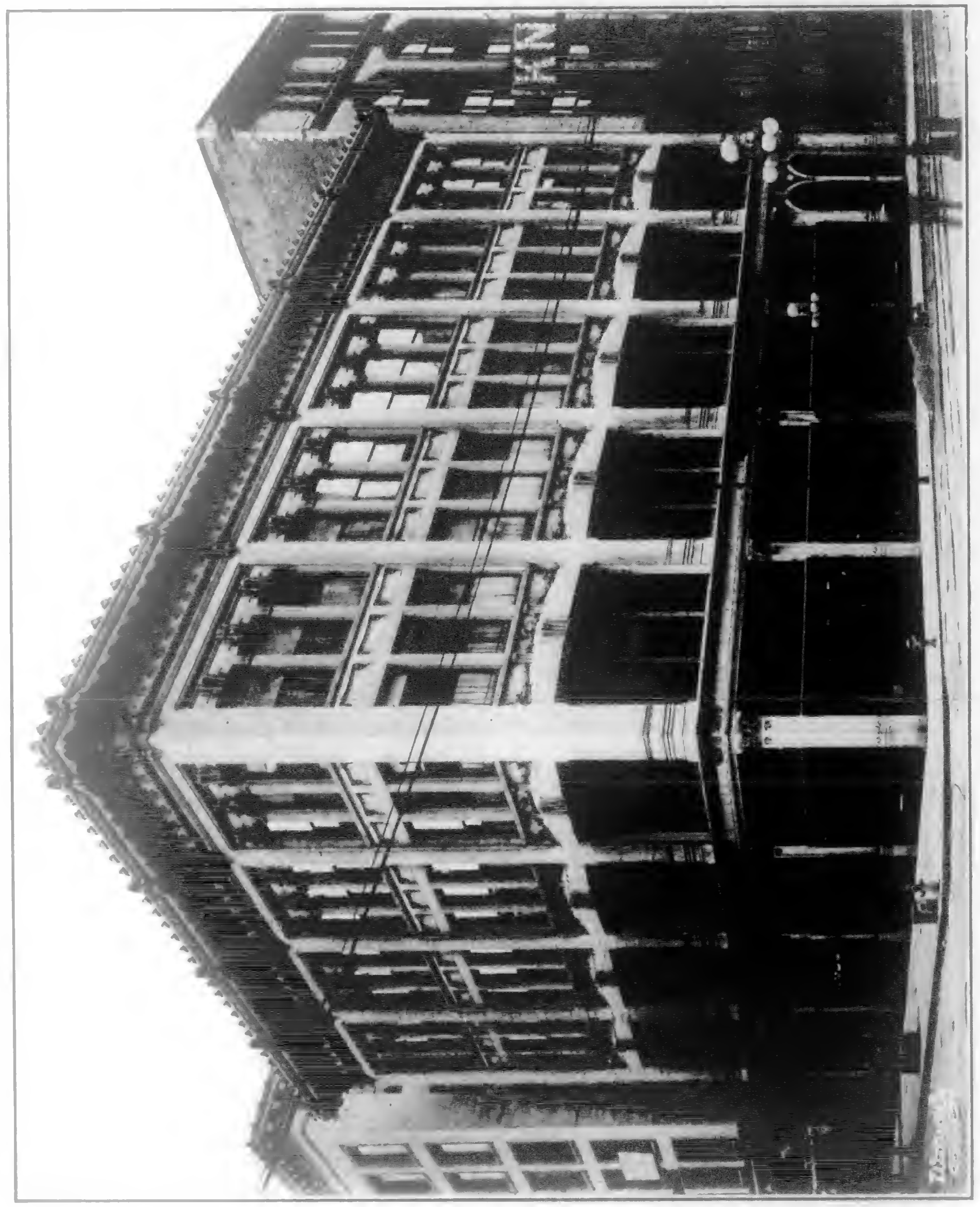
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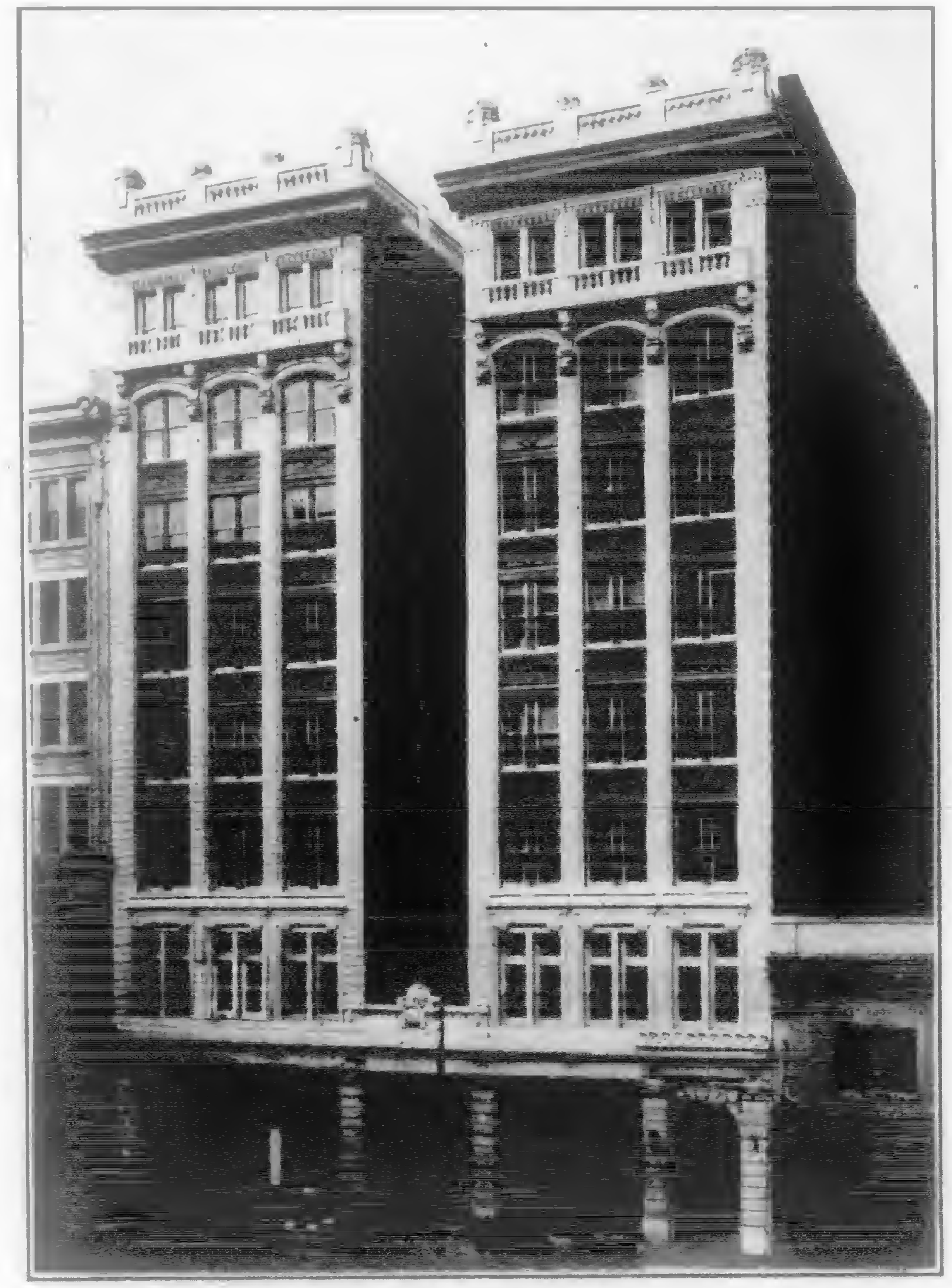
Hastings Building, San Francisco



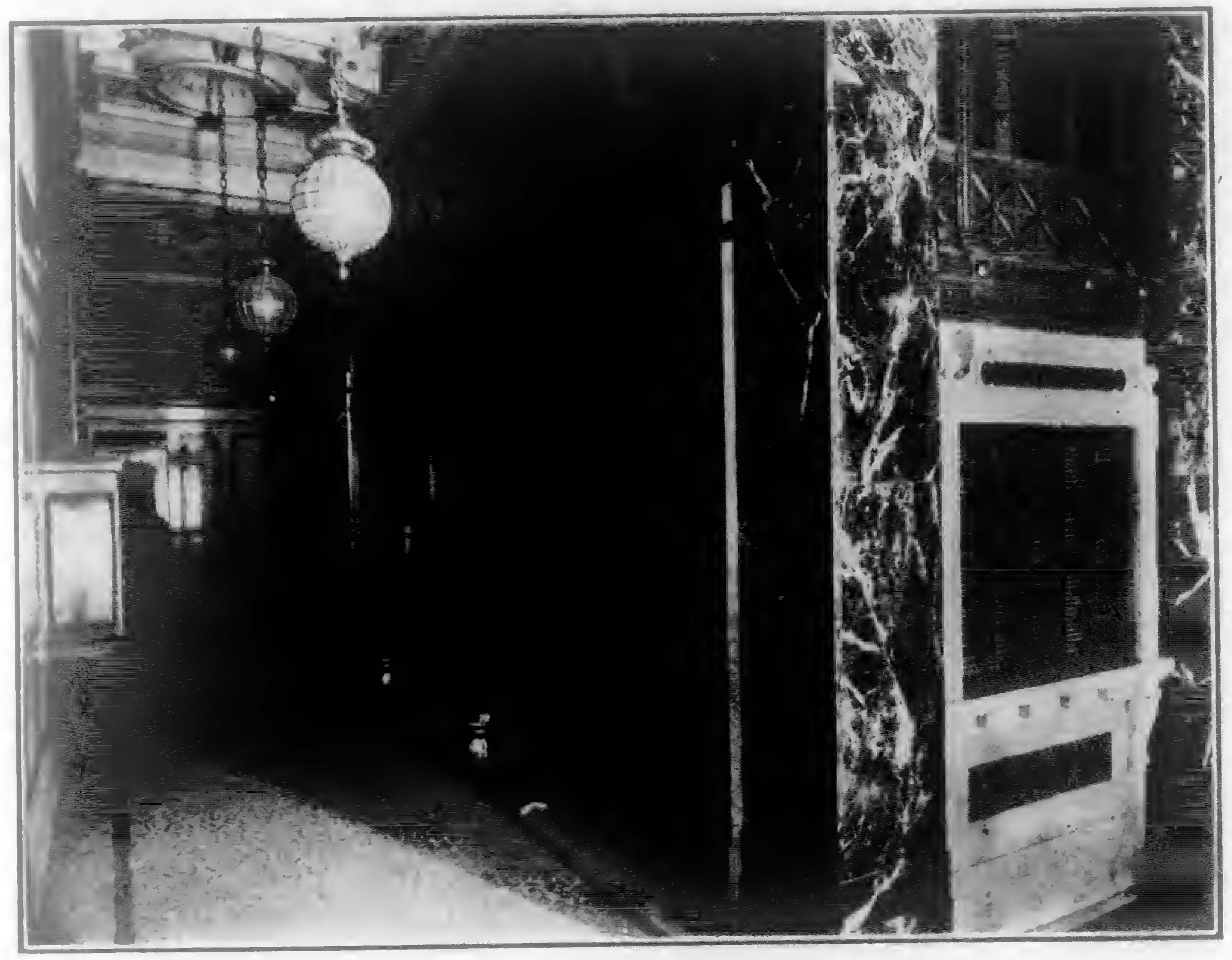
Foxcroft Building, San Francisco



Hastings Building, San Francisco



Foxcroft Building, San Francisco



Entrance Hall, Foxcroft Building



Entrance Hall, Monadnock Building



Monadnock Building, San Francisco



Building for the Pacific Realty Company, San Francisco
Frederick H. Meyer, Architect



Entrance Hall, Foxcroft Building



Entrance Hall, Monadnock Building



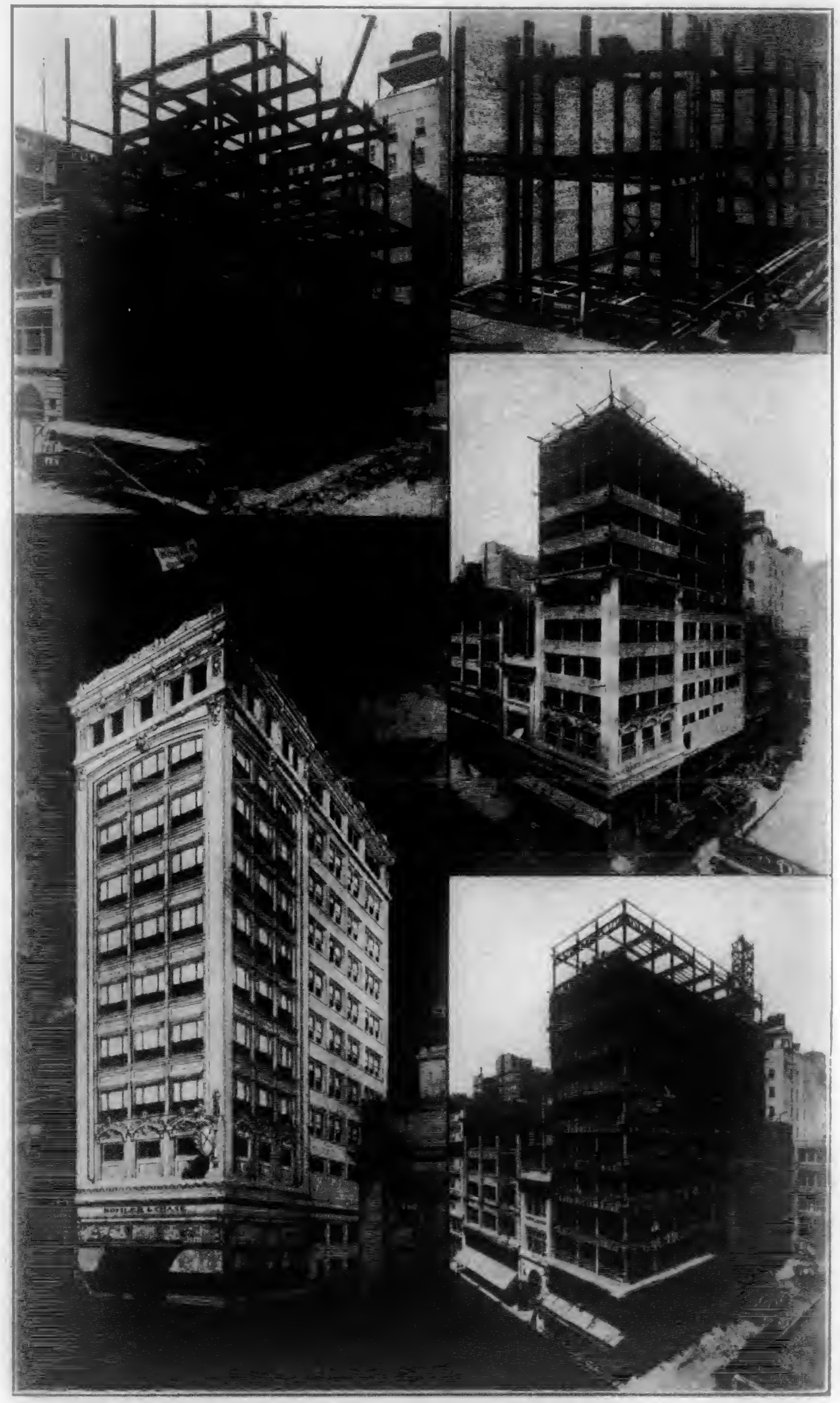
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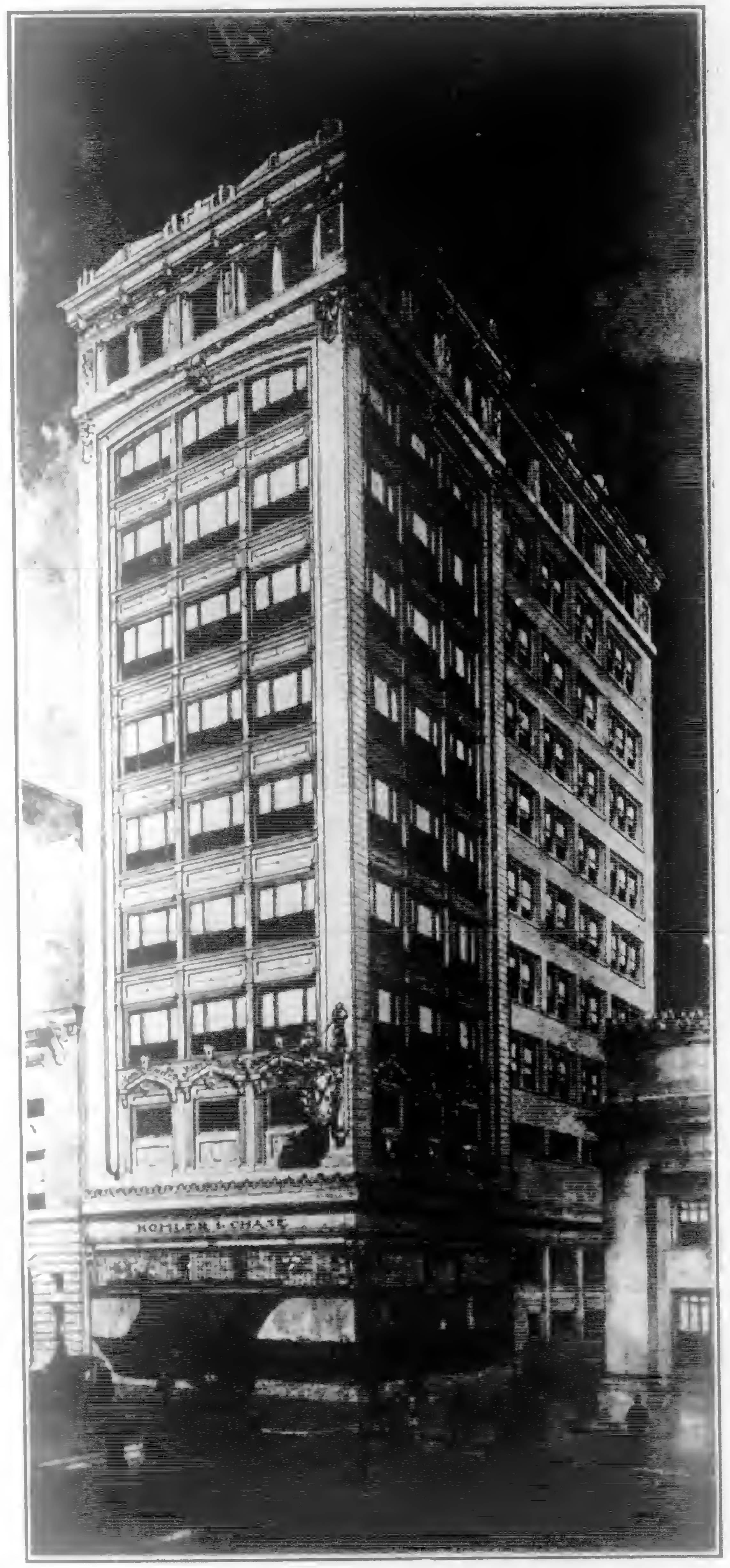
Building for the Pacific Realty Company, San Francisco
Frederick H. Meyer, Architect



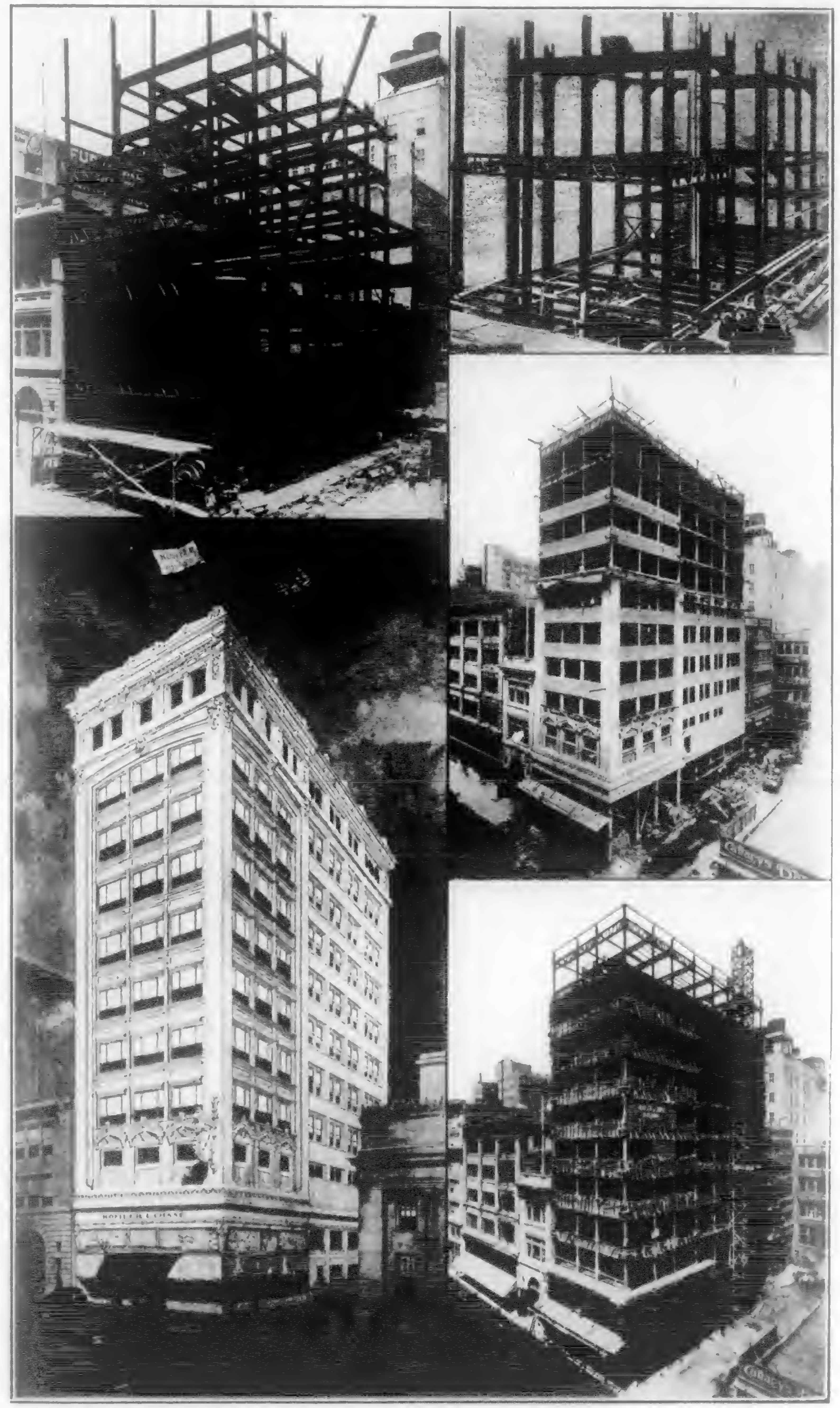
Kohler & Chase Building, San Francisco
Frederick H. Meyer, Architect



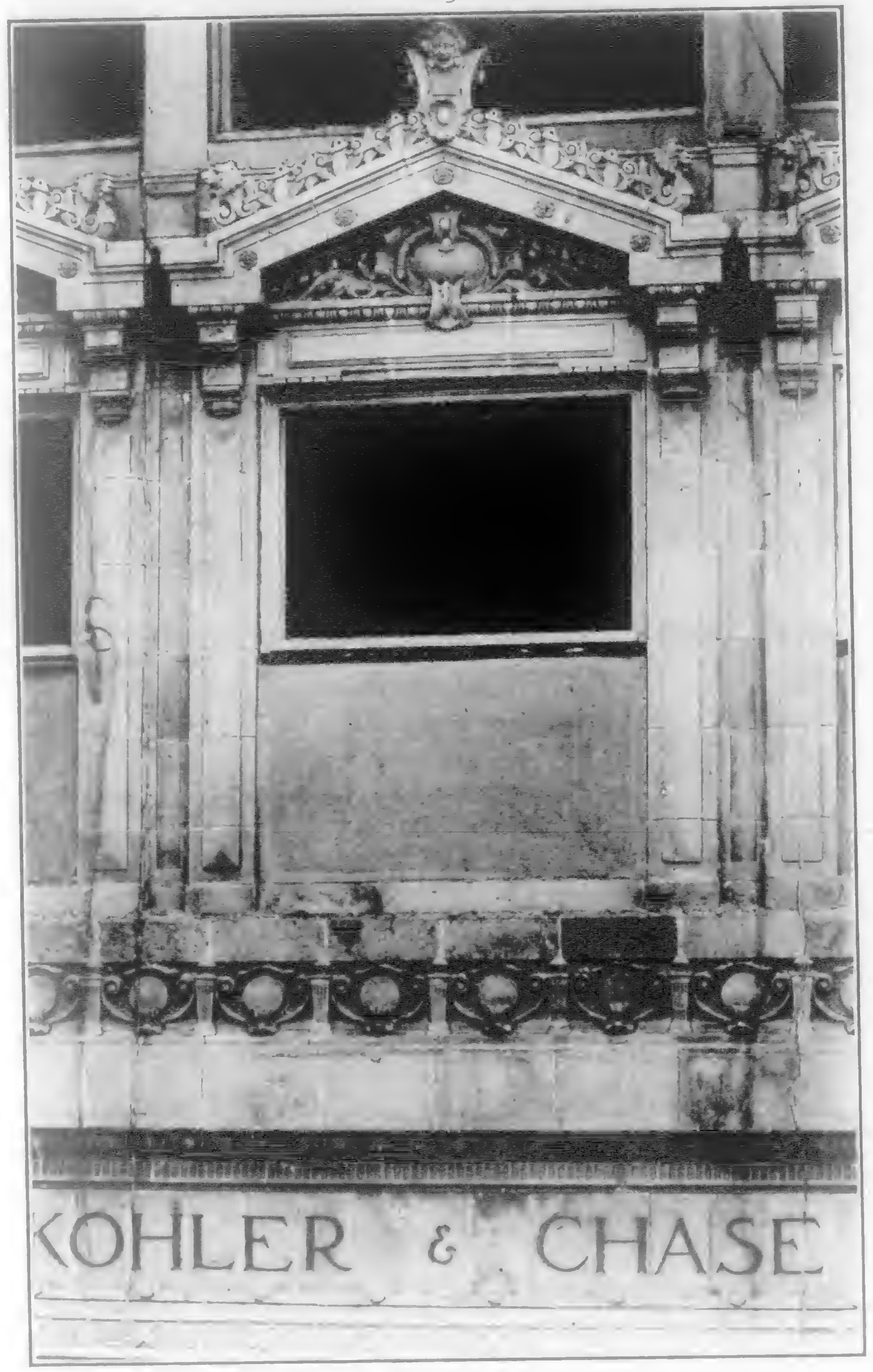
Kohler & Chase Building, San Francisco, showing progress work from June 12th (upper right) to September 1st (lower right), and Architect's Drawing of Finished Structure
Frederick H. Meyer, Architect



Kohler & Chase Building, San Francisco
Frederick H. Meyer, Architect



Kohler & Chase Building, San Francisco, showing progress work from June 12th (upper right) to September 1st (lower right), and Architect's Drawing of Finished Structure
Frederick H. Meyer, Architect



Detail of Terra Cotta, Over Second Story Windows, Kohler & Chase Building, San Francisco

Frederick H. Meyer, Architect



Hooker & Lent Building, San Francisco

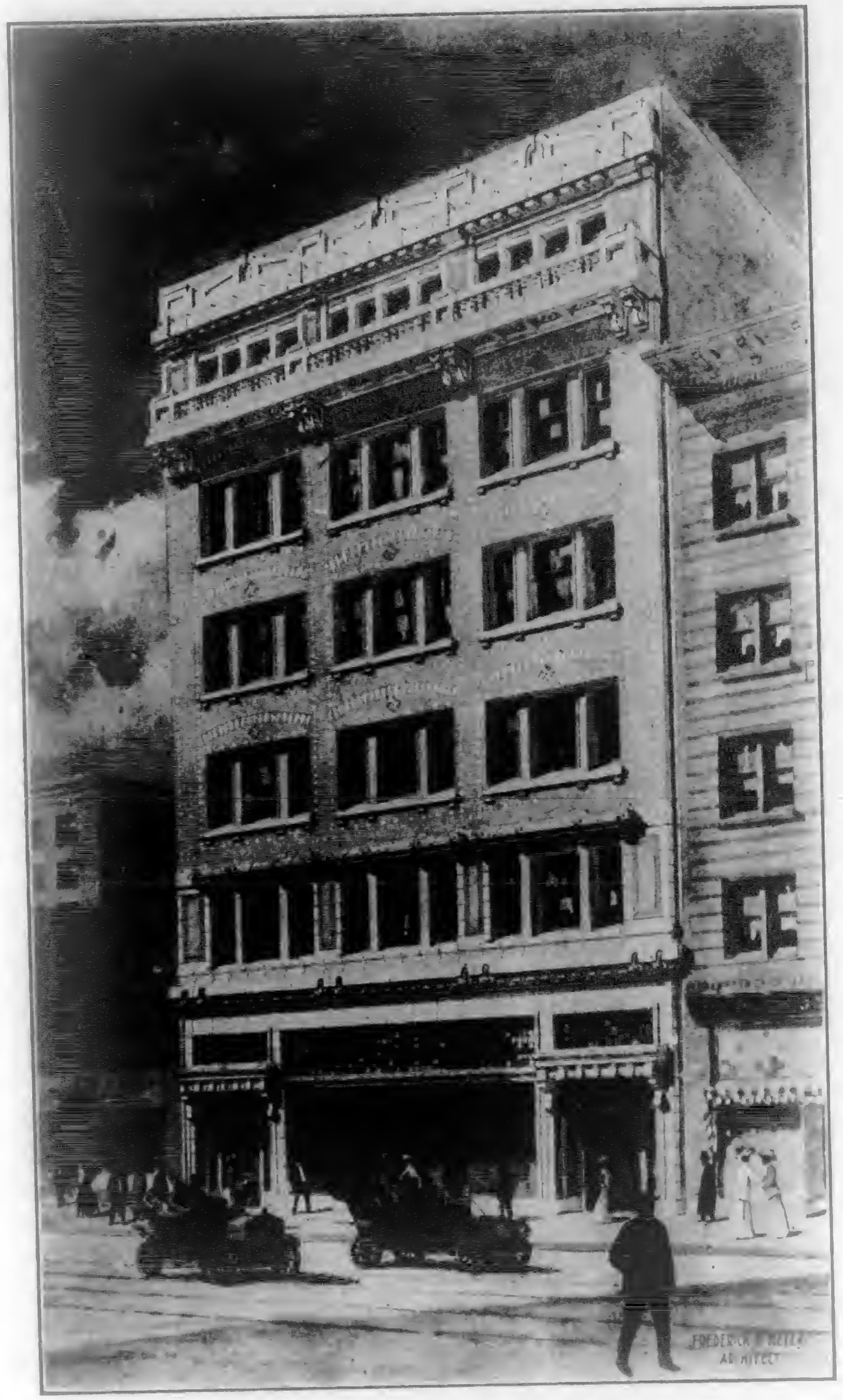


Detail of Terra Cotta, Over Second Story Windows, Kohler & Chase Building, San Francisco

Frederick H. Meyer, Architect



Hooker & Lent Building, San Francisco



Building for the Pope Estate, San Francisco
Frederick H. Meyer, Architect



Hoefler Building, San Francisco
Frederick H. Meyer, Architect



Interior San Francisco Gas & Electric Building



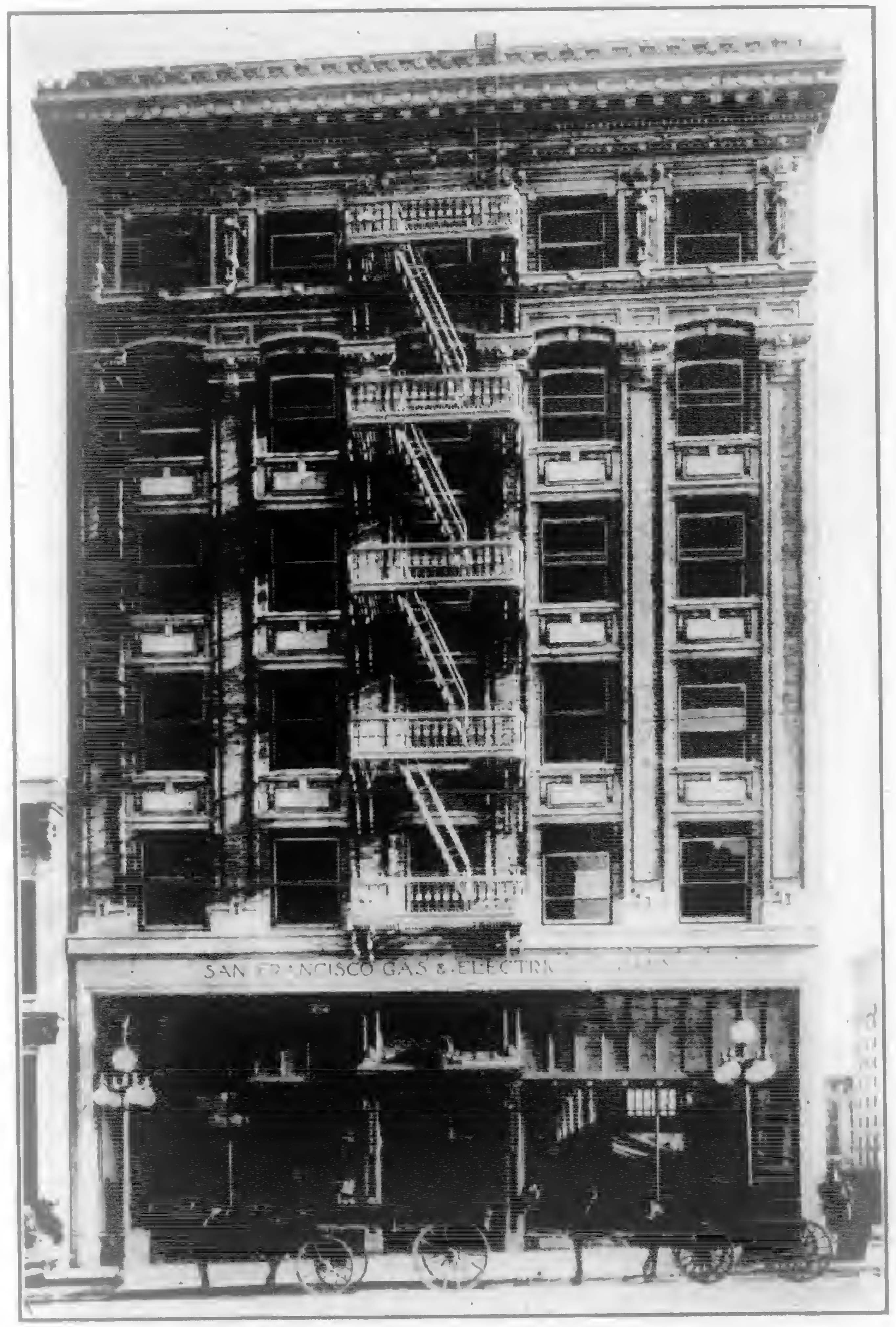
Building for the Pope Estate, San Francisco
Frederick H. Meyer, Architect



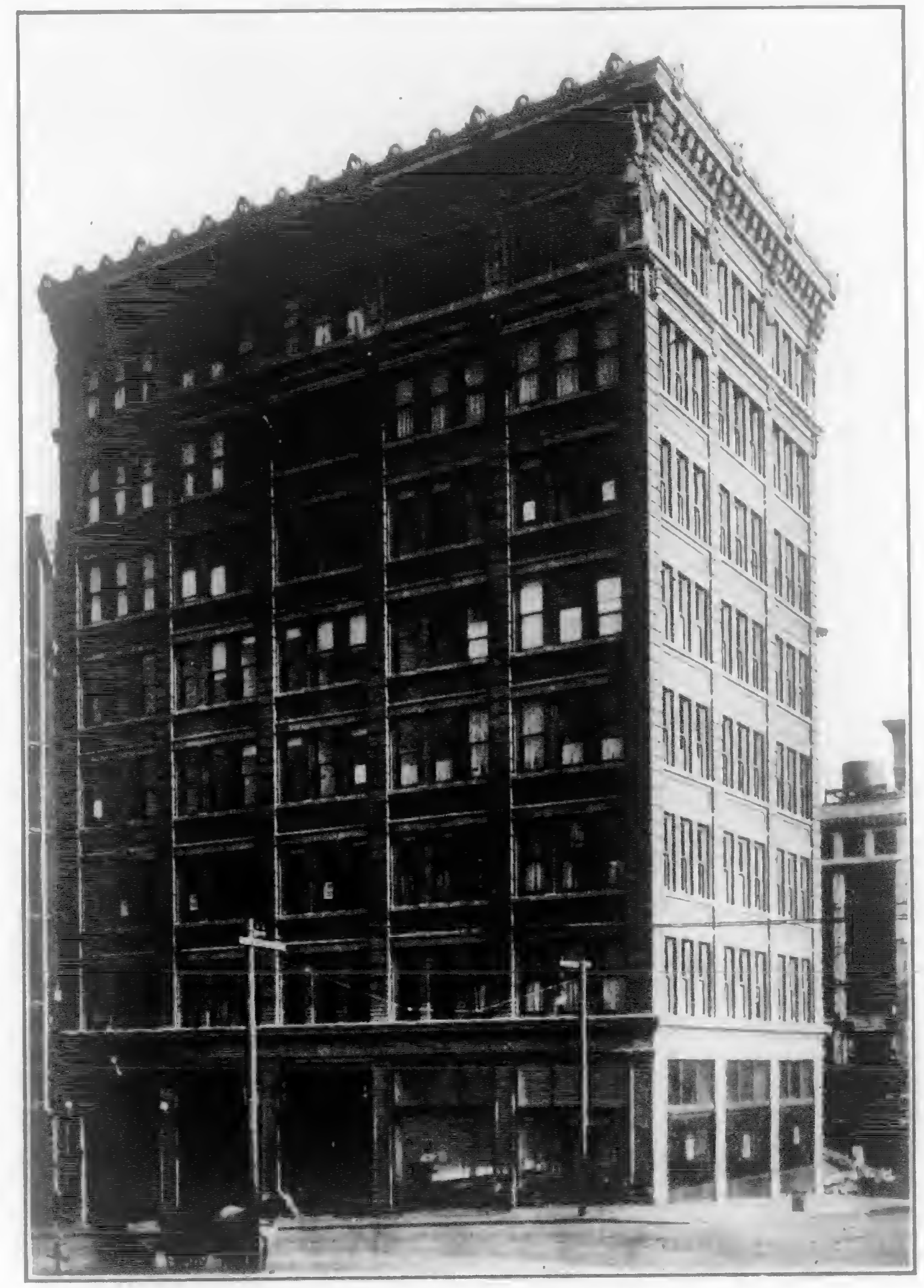
Hoefler Building, San Francisco
Frederick H. Meyer, Architect



Interior San Francisco Gas & Electric Building



Building for San Francisco Gas & Electric Company, San Francisco
Frederick H. Meyer, Architect

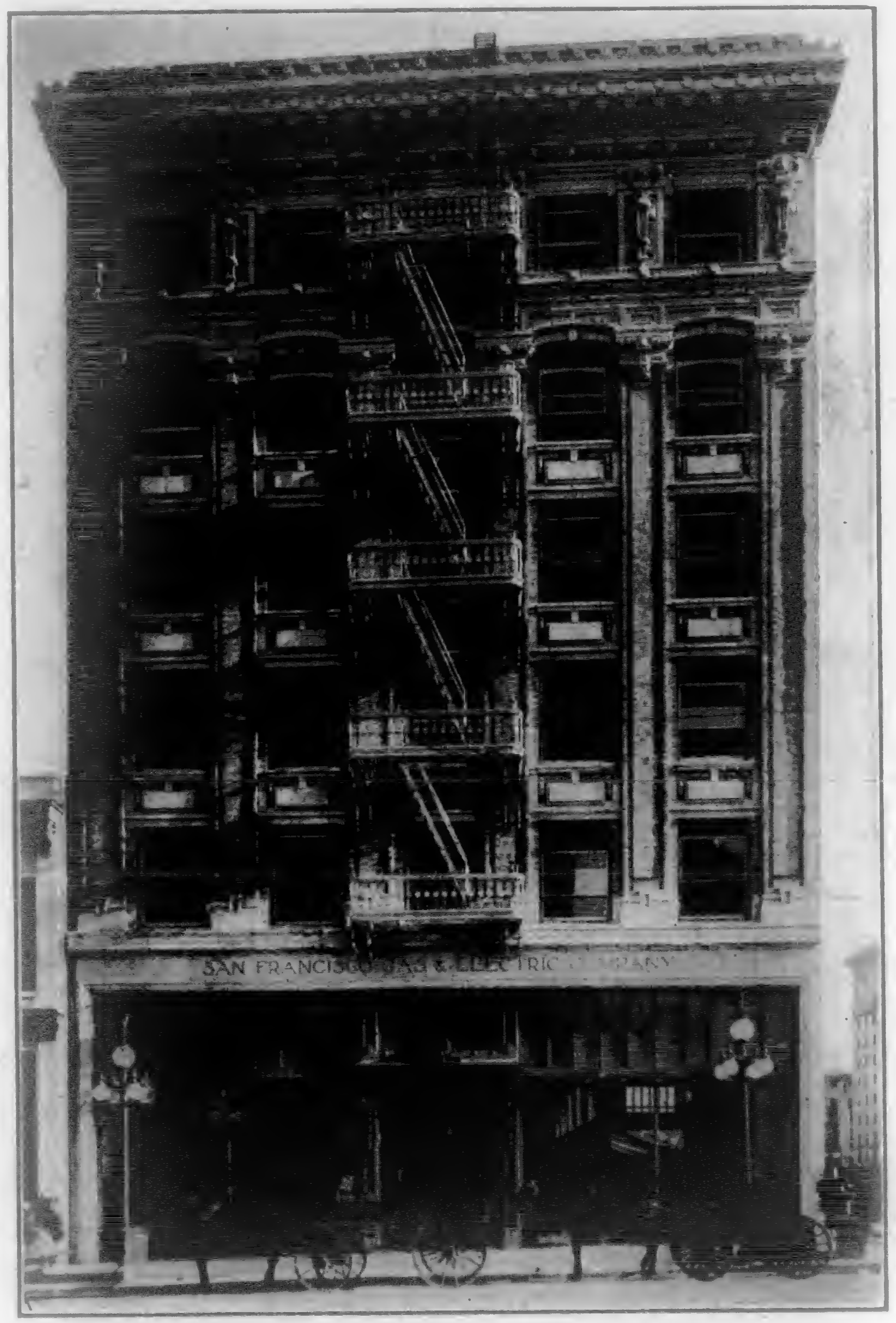


Galen Building, San Francisco

pressed air, sterilized water, gas, and alternating and direct electric currents conveyed to each room.

* * *

Of Architect Meyer's work since the disastrous fire in 1906, the Humboldt Savings Bank building, planned jointly by Mr. Meyer and Mr. Smith O'Brien, his former partner, stands out prominently as one of his most successful attempts at office building construction. It was virtually the first tall office building to be erected in San Francisco after the fire. The structure at once attracted attention, both on account of its extreme height and its massive reinforced concrete walls, the success of which undoubtedly influenced to some extent the owners of the Phelan, Mac-



Building for San Francisco Gas & Electric Company, San Francisco
Frederick H. Meyer, Architect

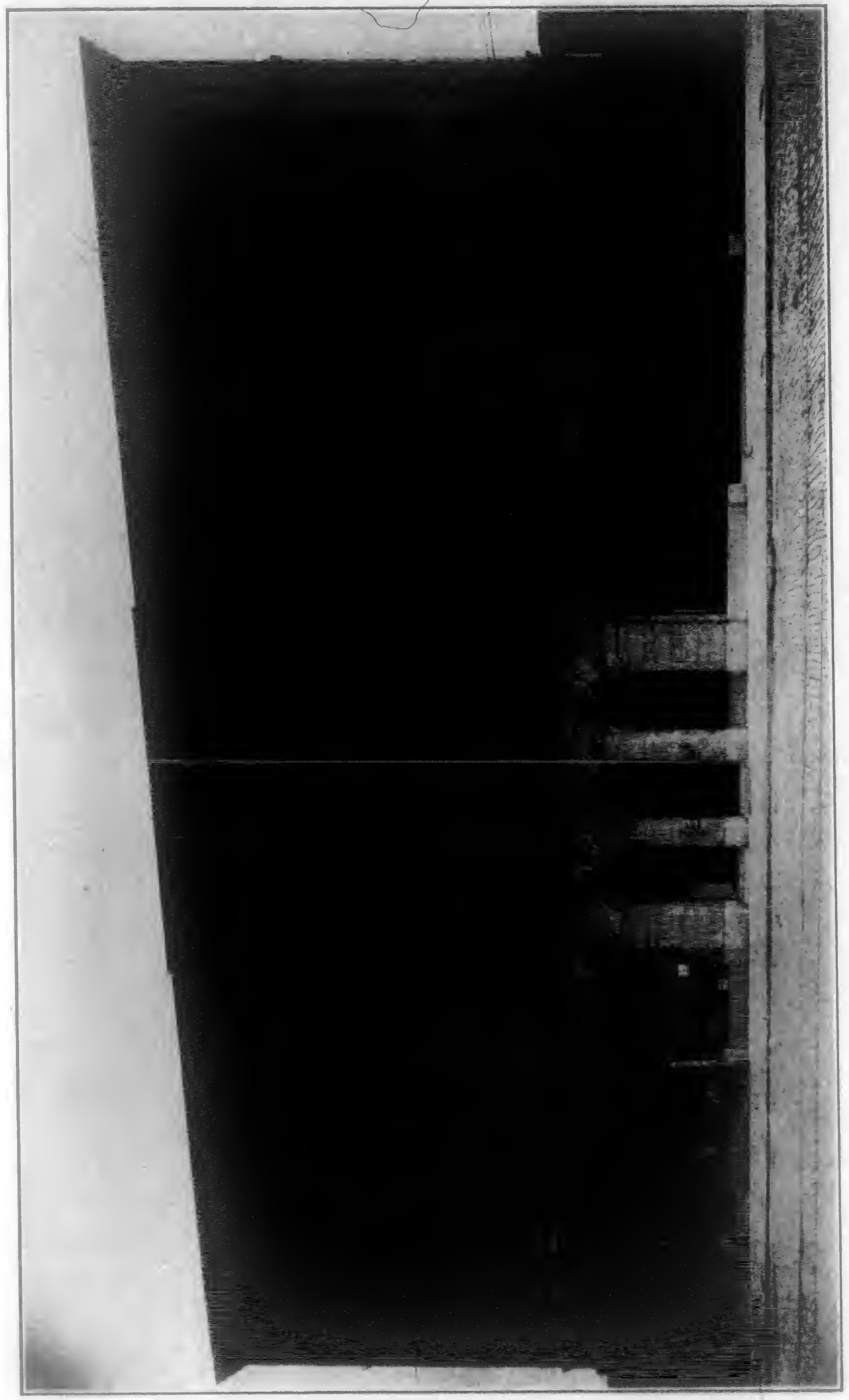


Galen Building, San Francisco

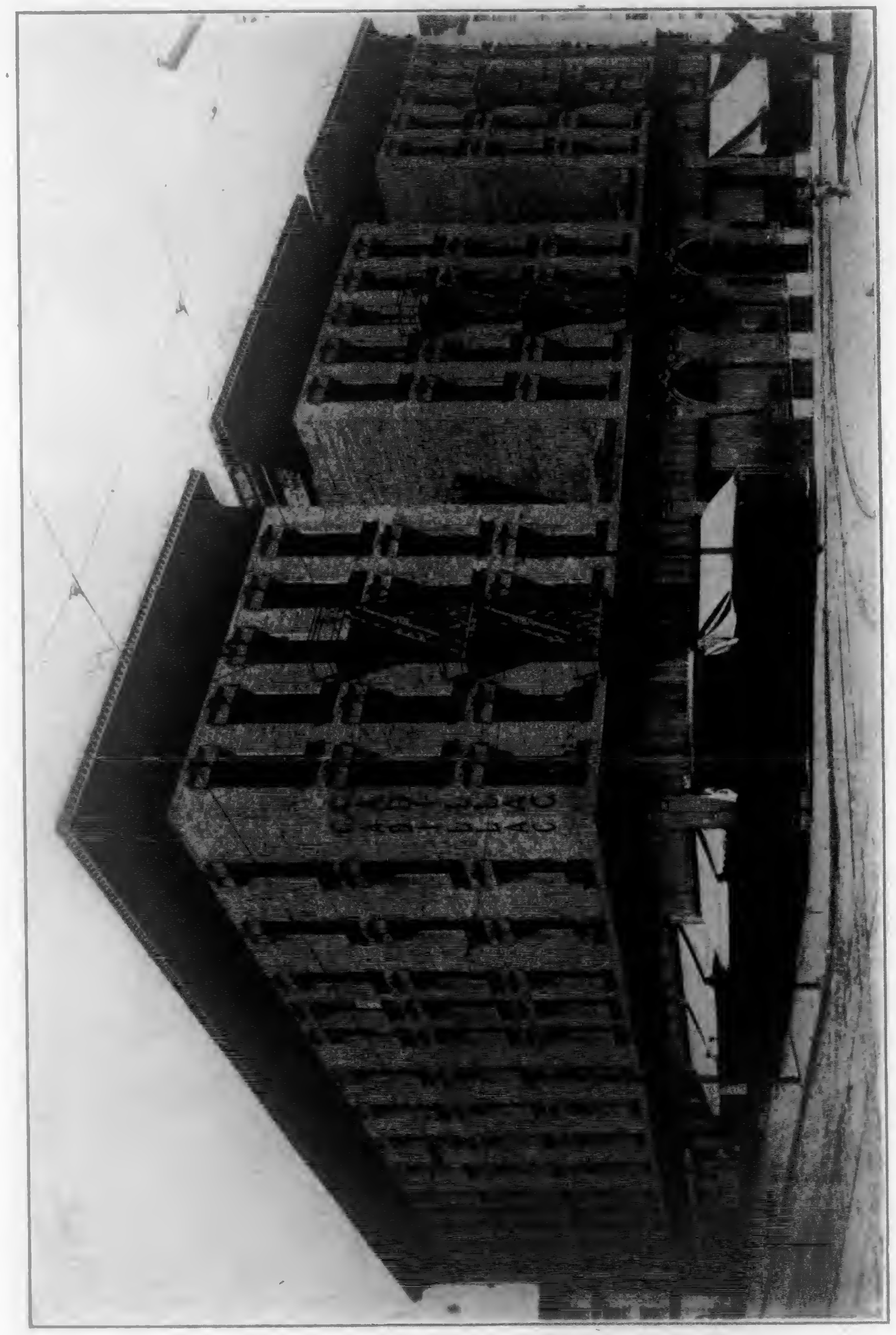
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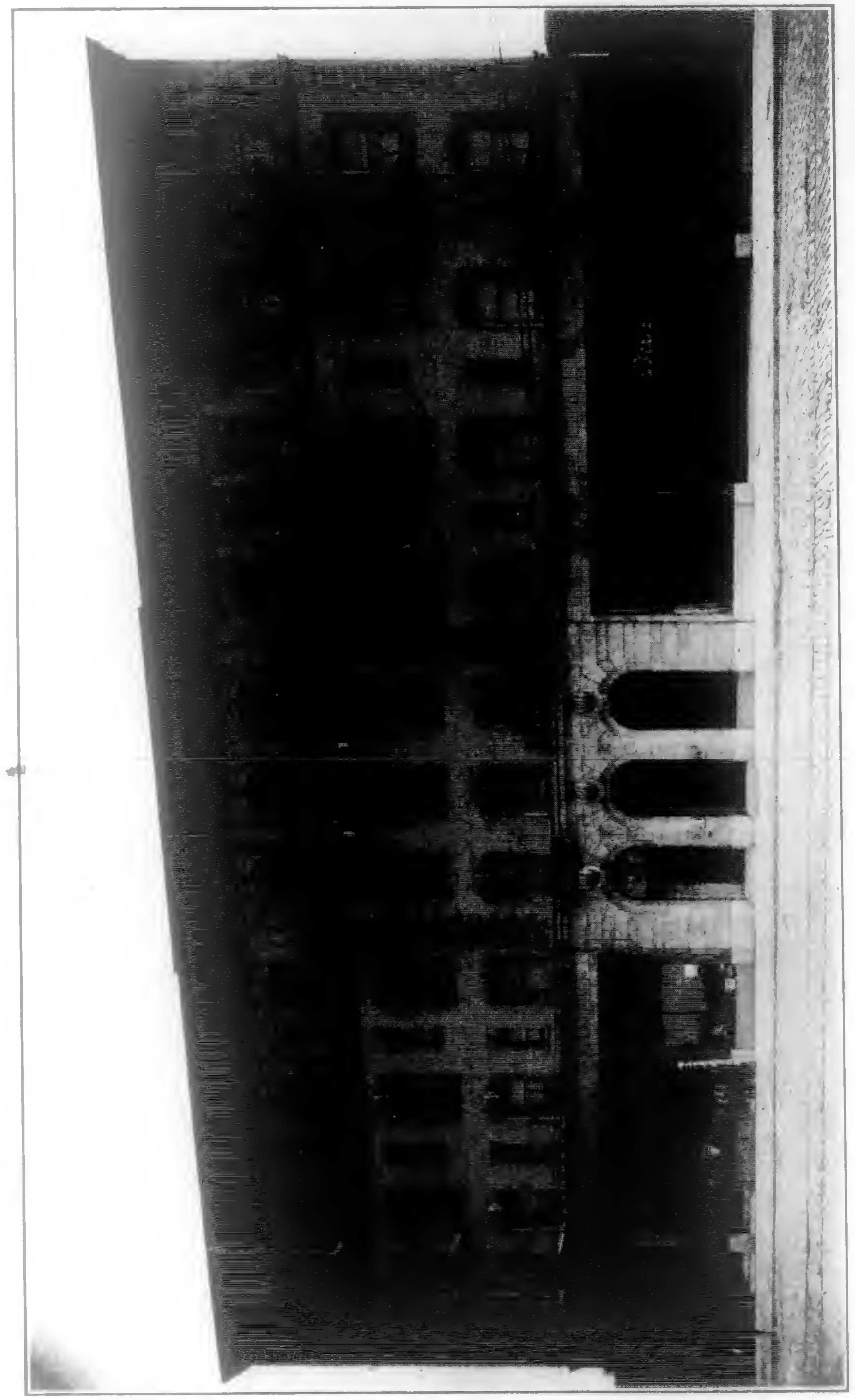
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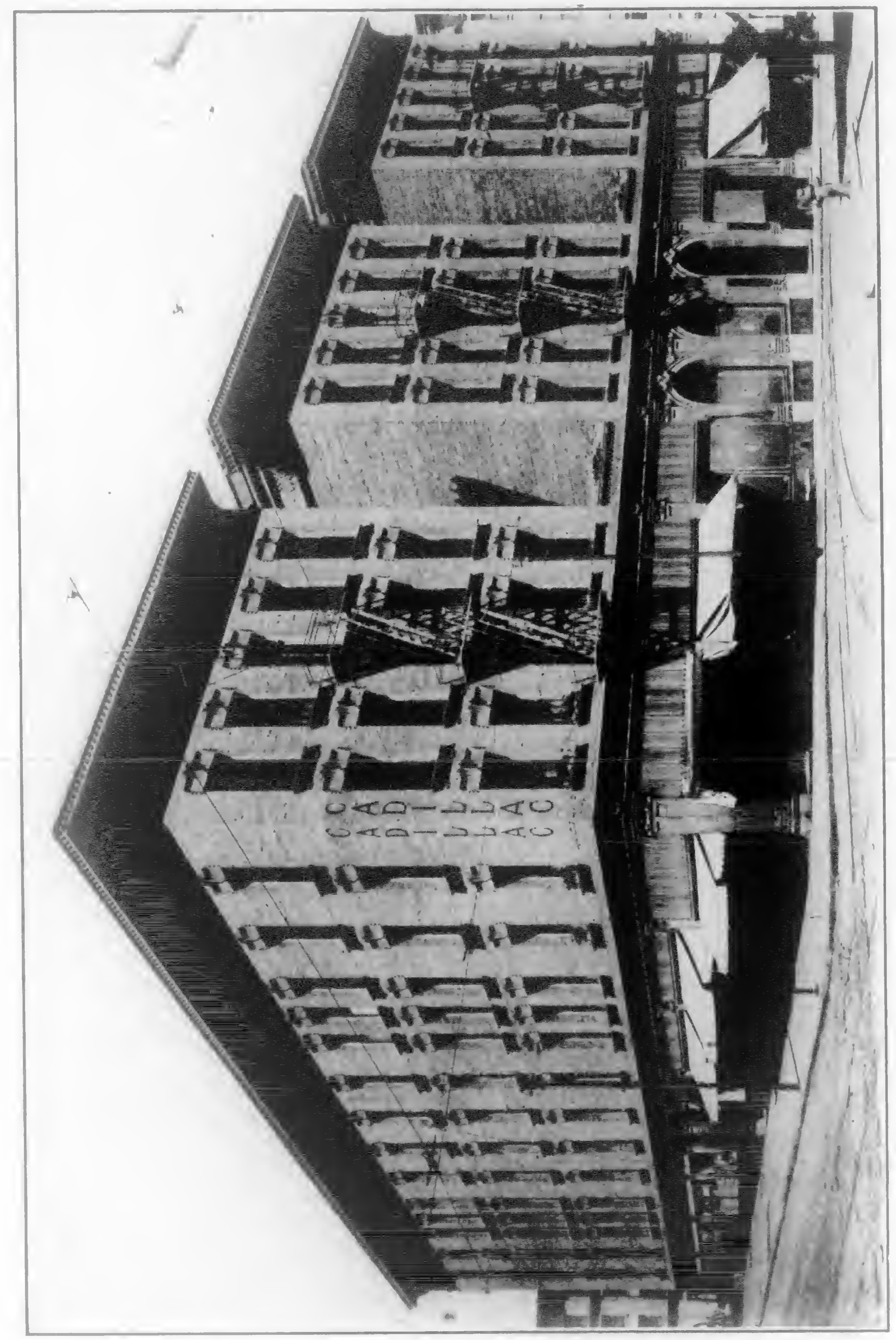
Hotel Brilliant, San Francisco



Cadillac Hotel, San Francisco



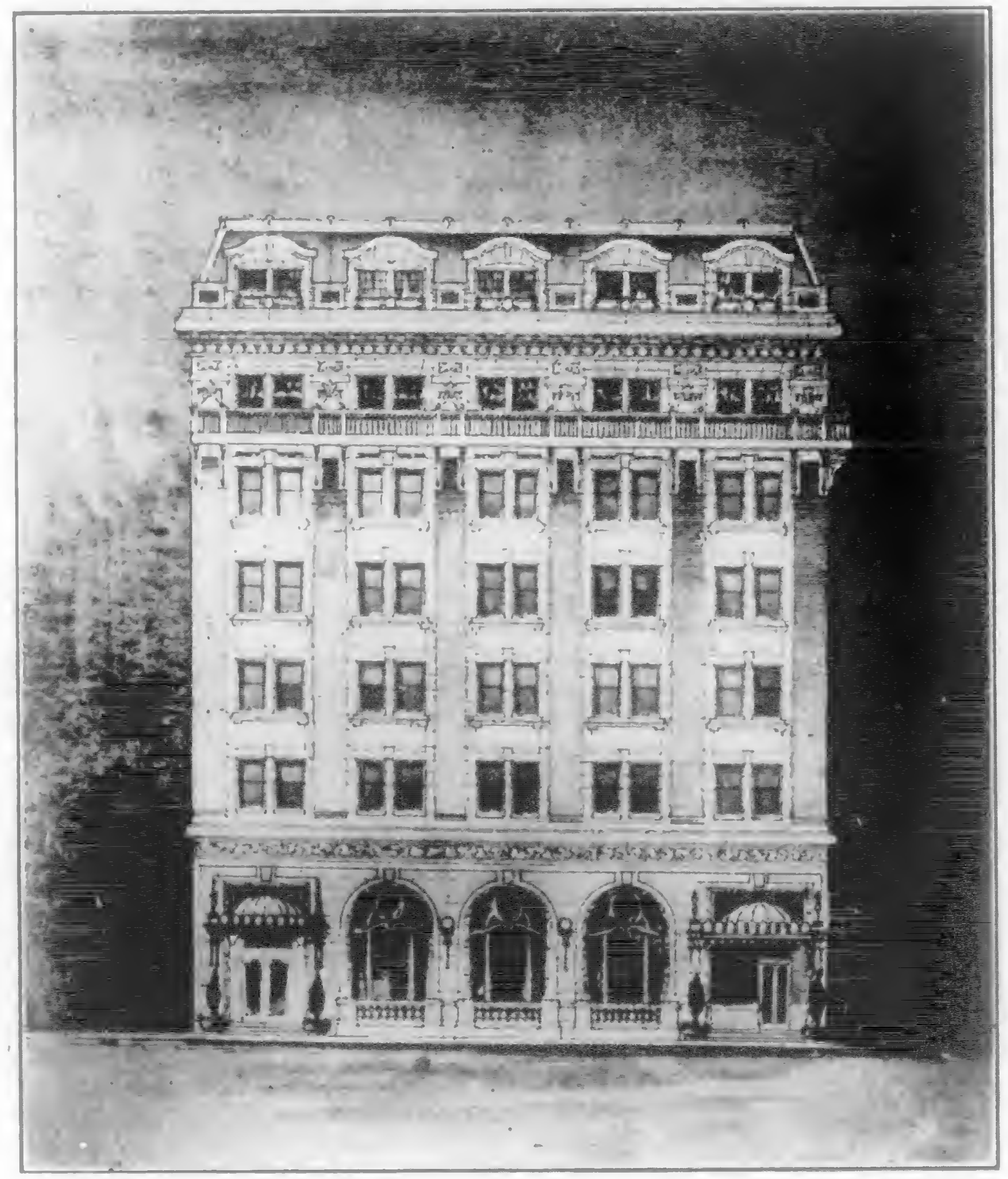
Hotel Brilliant, San Francisco



Cadillac Hotel, San Francisco



Howard Hotel, San Francisco



Design for a Hotel

Frederick H. Meyer, Architect



Chismore Apartments, San Francisco
Frederick H. Meyer, Architect

donough, Sheldon, Metropolis Bank and other tall buildings where concrete was used for the superstructure.

The Monadnock is another popular office building that was designed by the firm of Meyer and O'Brien, as was the Hooker and Lent building, at Market and First streets.

All the requirements that go to make the ideal office building, such as light, ventilation, ample floor space and service, have been successfully embodied in the Foxcroft building, an imposing eight-story structure that occupies the center of the block facing Post street, between Montgomery and Kearny streets, San Francisco.

Besides office buildings, Mr. Meyer has given special attention to apartment houses, some of the more prominent of which are the Norris apartment flats at Green and Leavenworth streets, the Bauer, the Fennell, the Hueter and the Engelcke apartments, the two last-named buildings being under construction at the present time. They are the very latest types of apartment house construction, embodying all the new features which go to provide comfort and convenience for the tenants.



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Hueter and Tillman Apartments, San Francisco
Frederick H. Meyer, Architect



Apartments for the Bloomingdale Estate, San Francisco



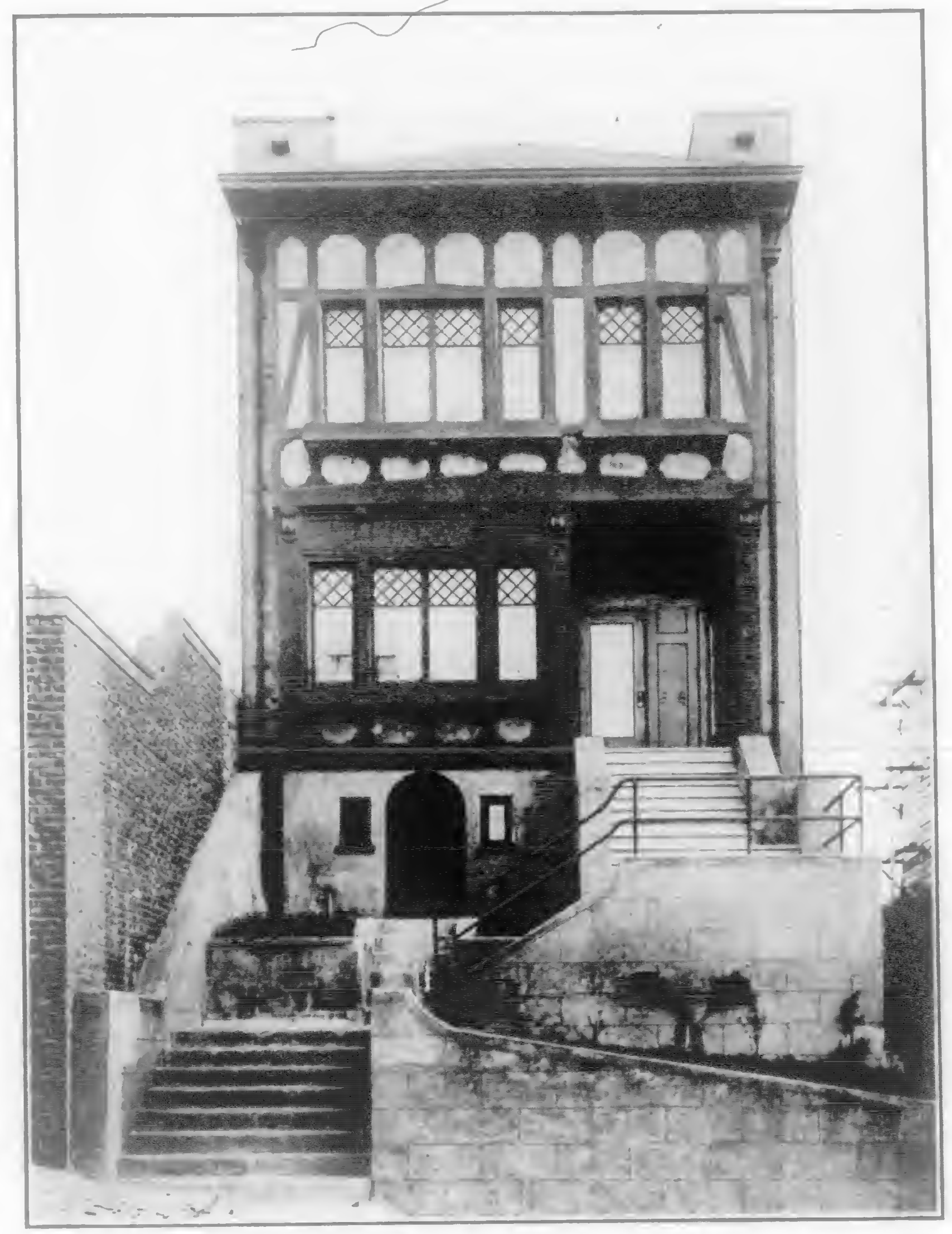
Flats for Mr. Edward Convey, San Francisco
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Hueter and Tillman Apartments, San Francisco
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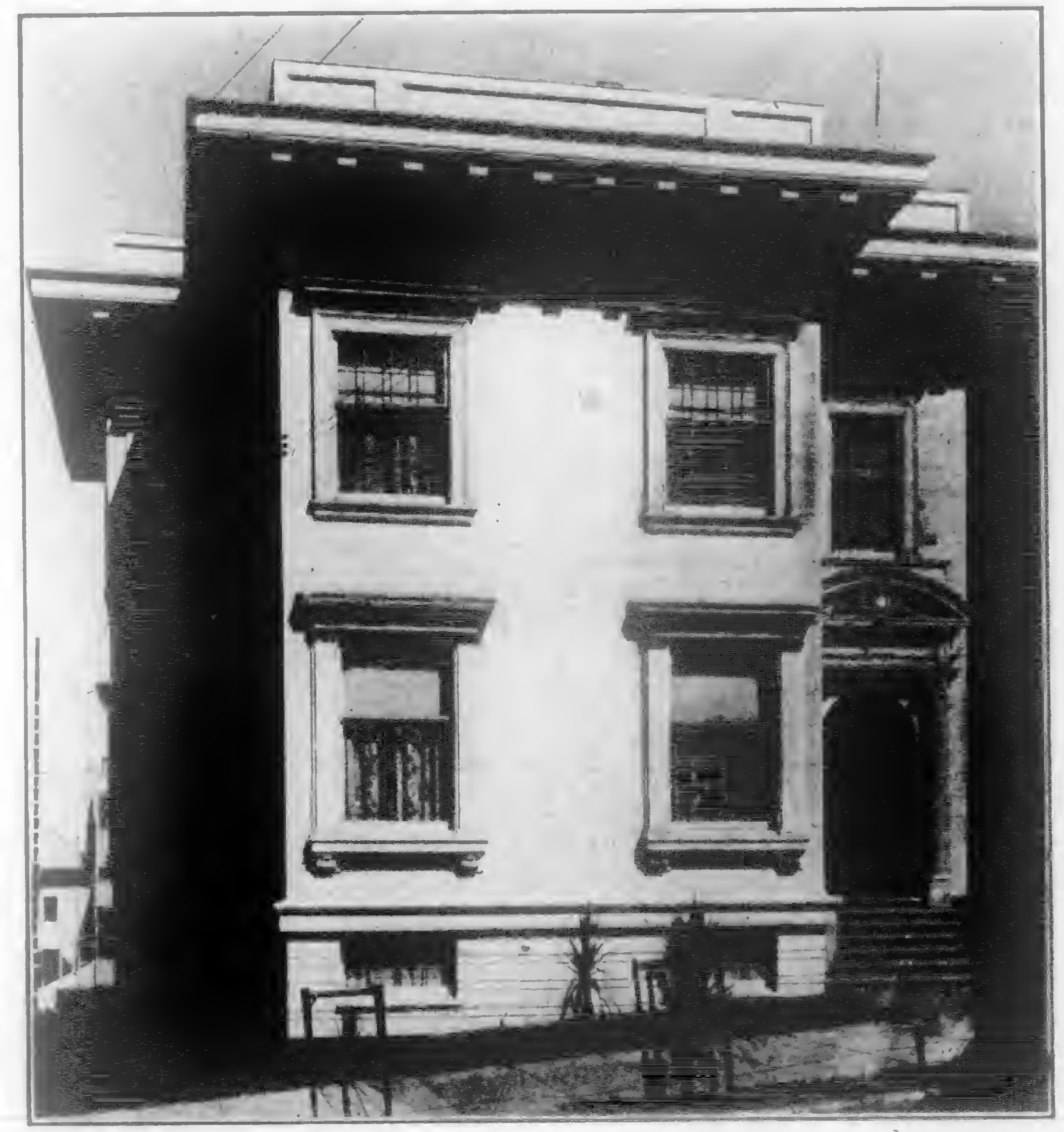
Flats for Mr. Edward Convey, San Francisco
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The L. A. Norris Flats, San Francisco
Frederick H. Meyer, Architect



The L. A. Norris Flats—Interior Court View



Flats for Mrs. Minnie Bauer, San Francisco



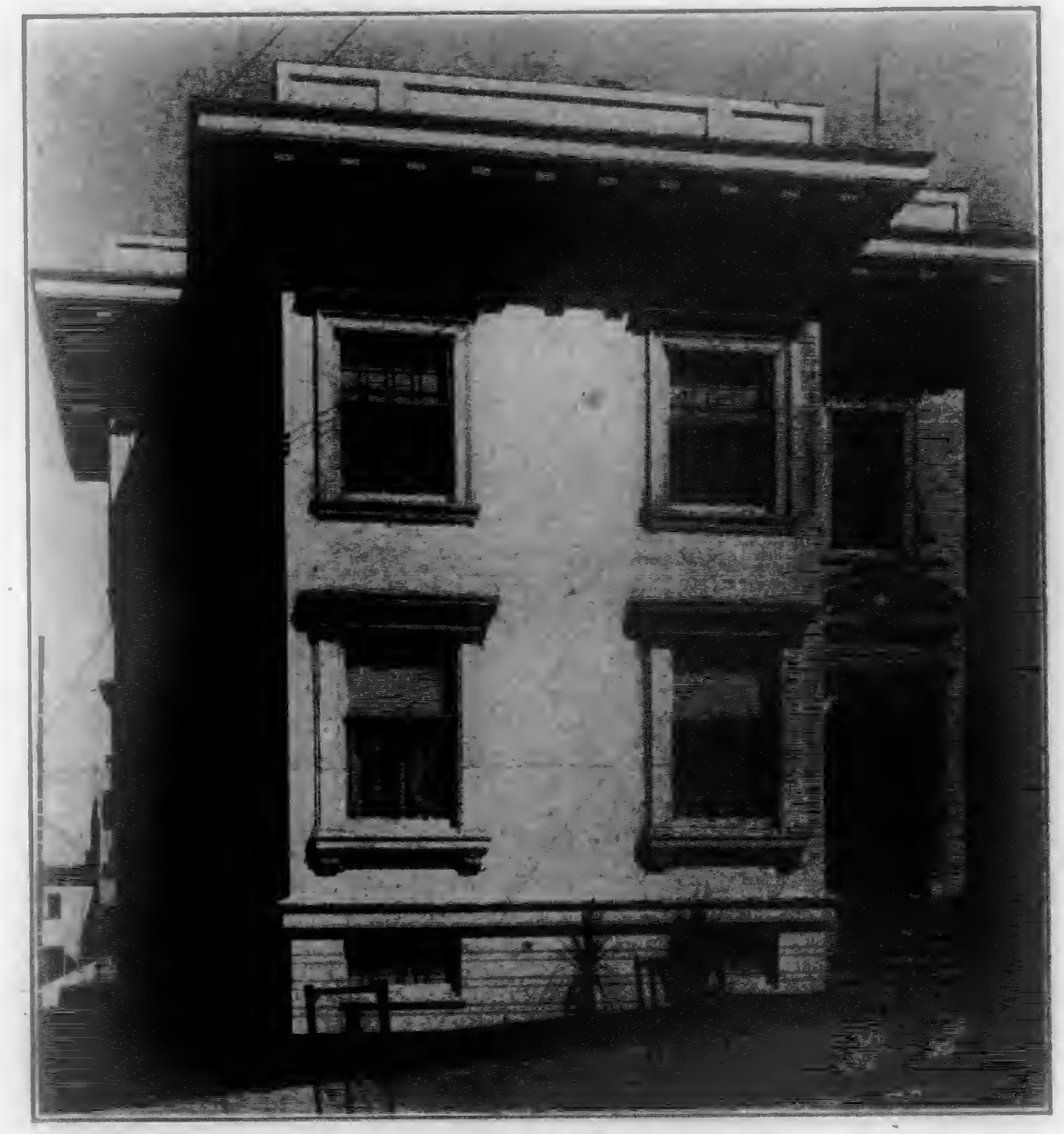
Flats for Mr. Martin Fennell,
San Francisco
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The L. A. Norris Flats, San Francisco
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The L. A. Norris Flats—Interior Court View



Flats for Mrs. Minnie Bauer, San Francisco



Flats for Mr. Martin Fennell,
San Francisco
Frederick H. Meyer, Architect



Store Front of Ye Orange Blossom, San Francisco



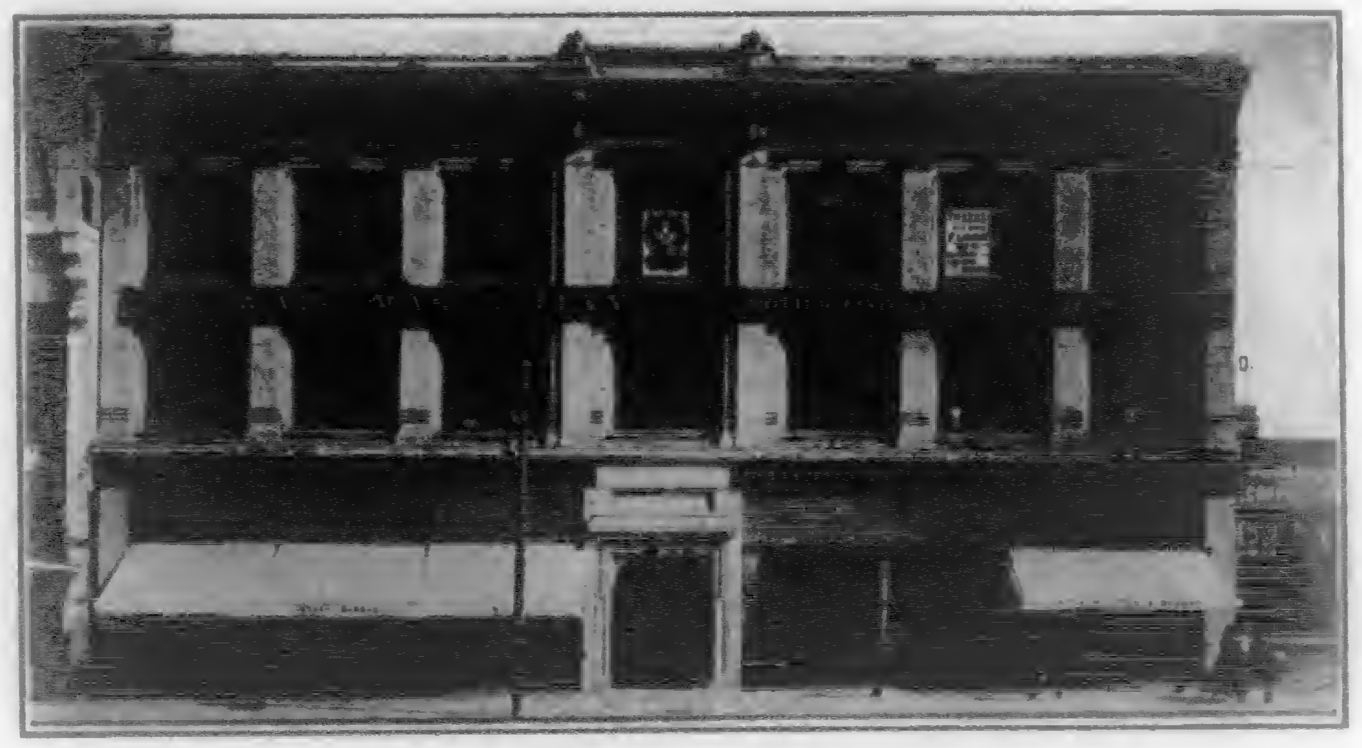
Interior of Ye Orange Blossom
Frederick H. Meyer, Architect

Building for
Mrs. Sarah Coffin





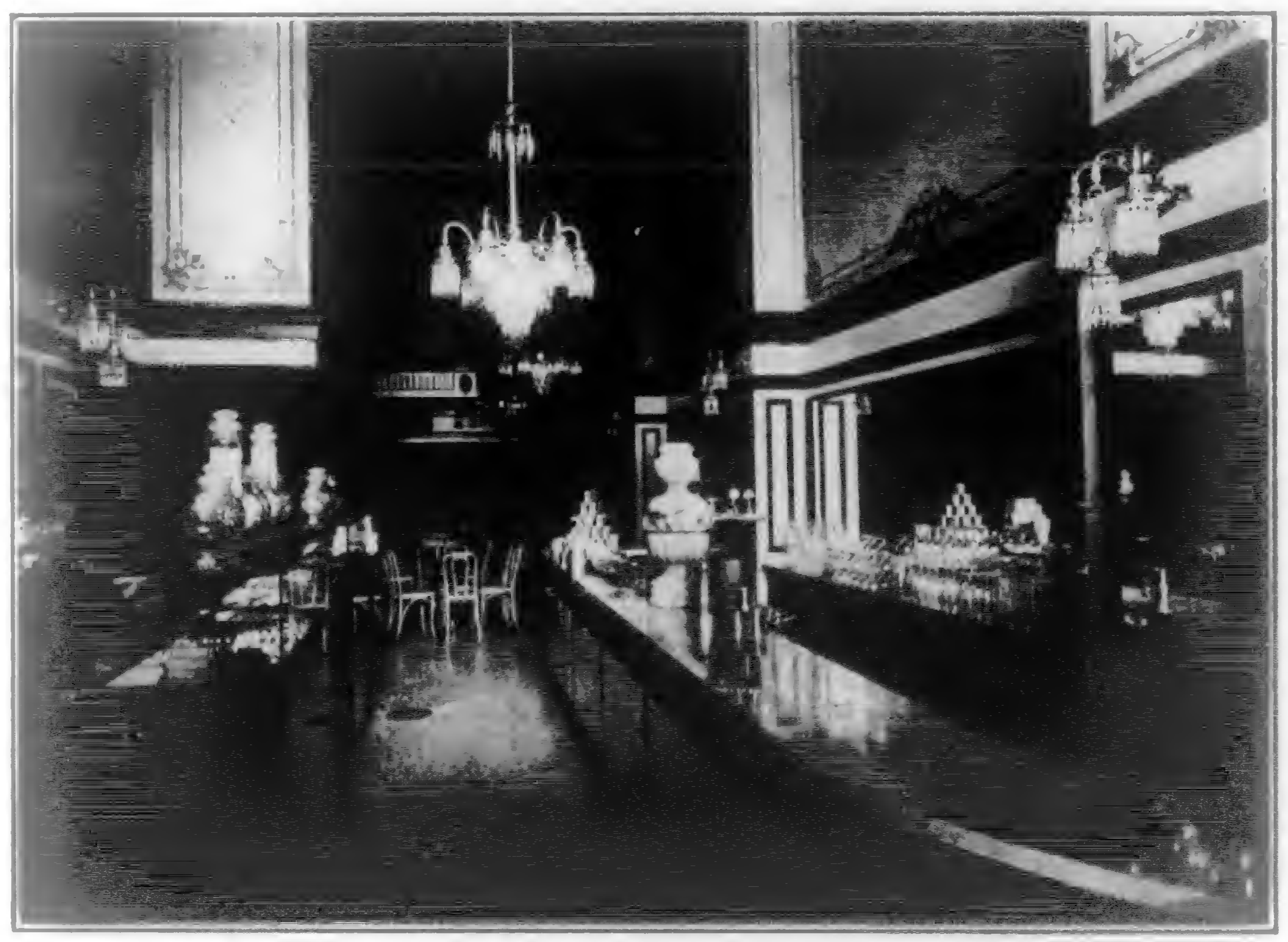
Building for the
Rincon Publishing
Company, San Francisco
Frederick H. Meyer,
Architect



M. Fisher Building, San Francisco



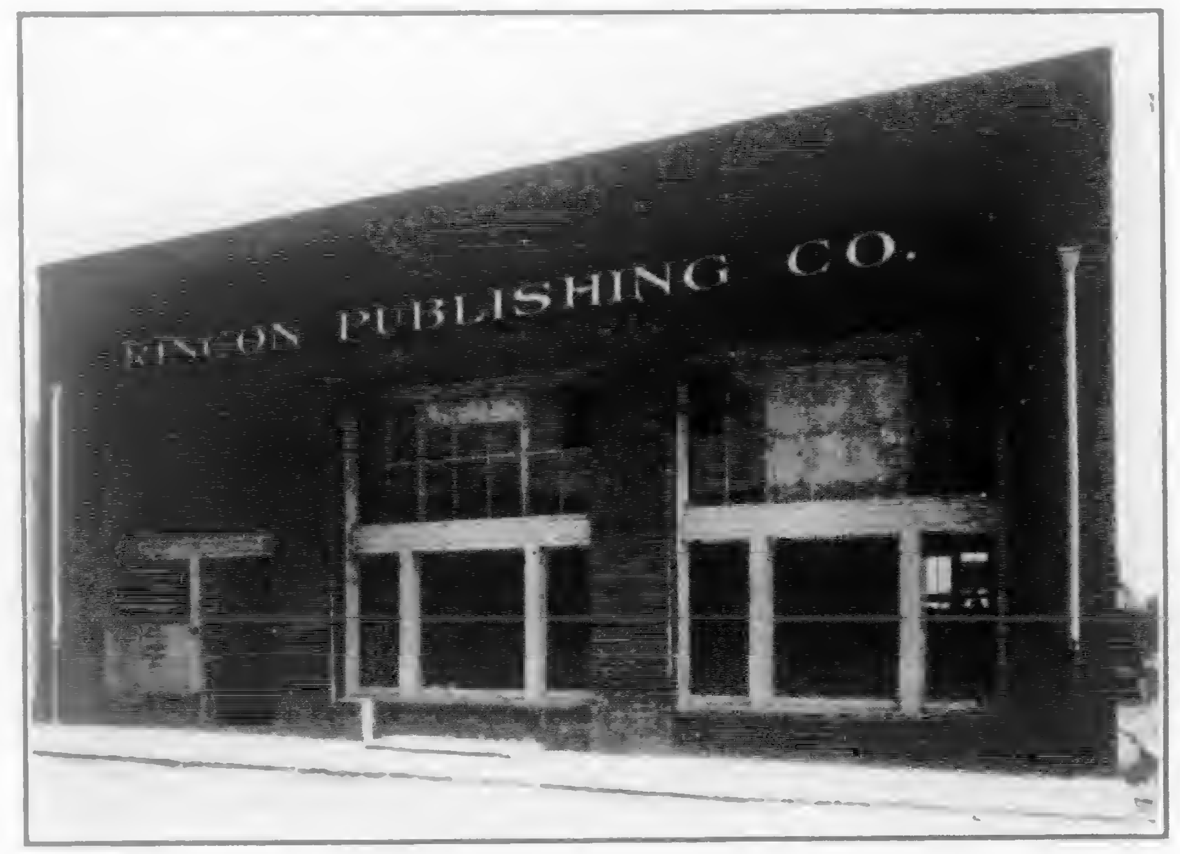
Store Front of Ye Orange Blossom, San Francisco



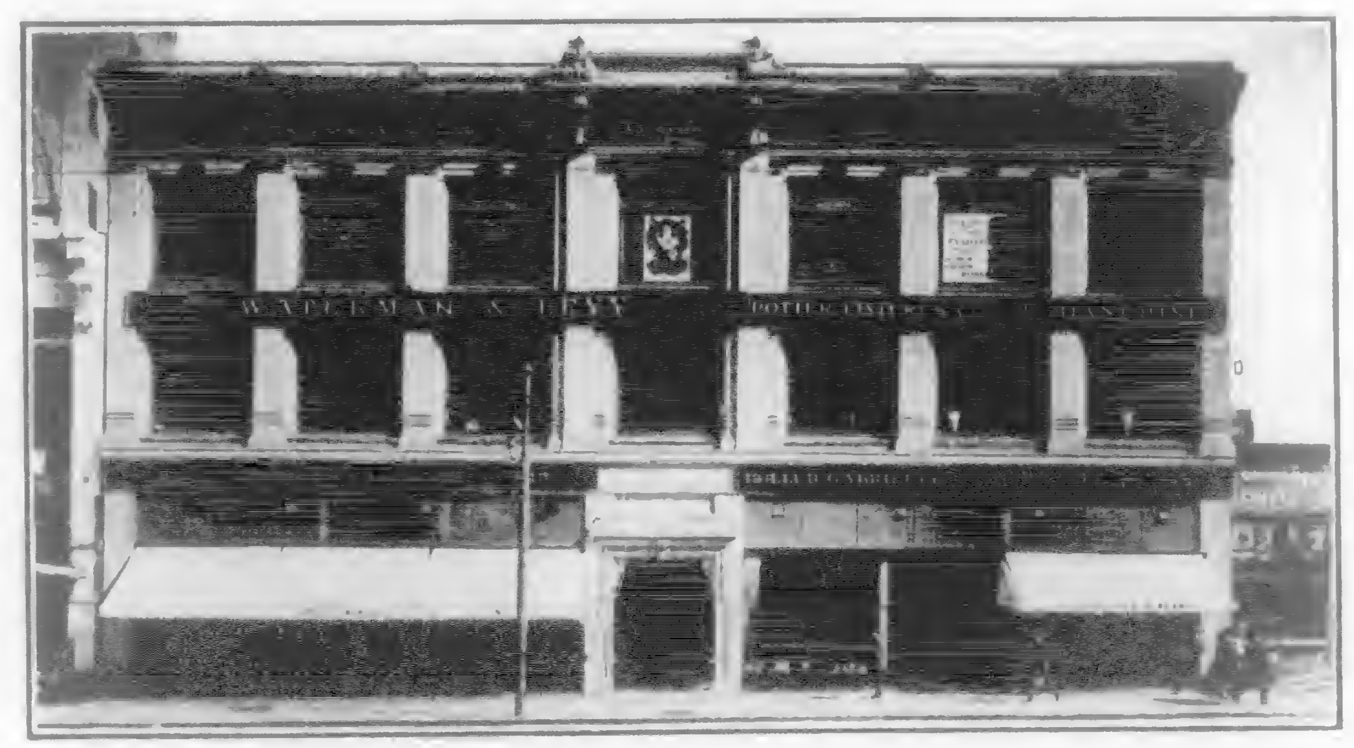
Interior of Ye Orange Blossom
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Building for the
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Company, San Francisco
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M. Fisher Building, San Francisco



Building for the Weinstock-Lubin Company, Sacramento



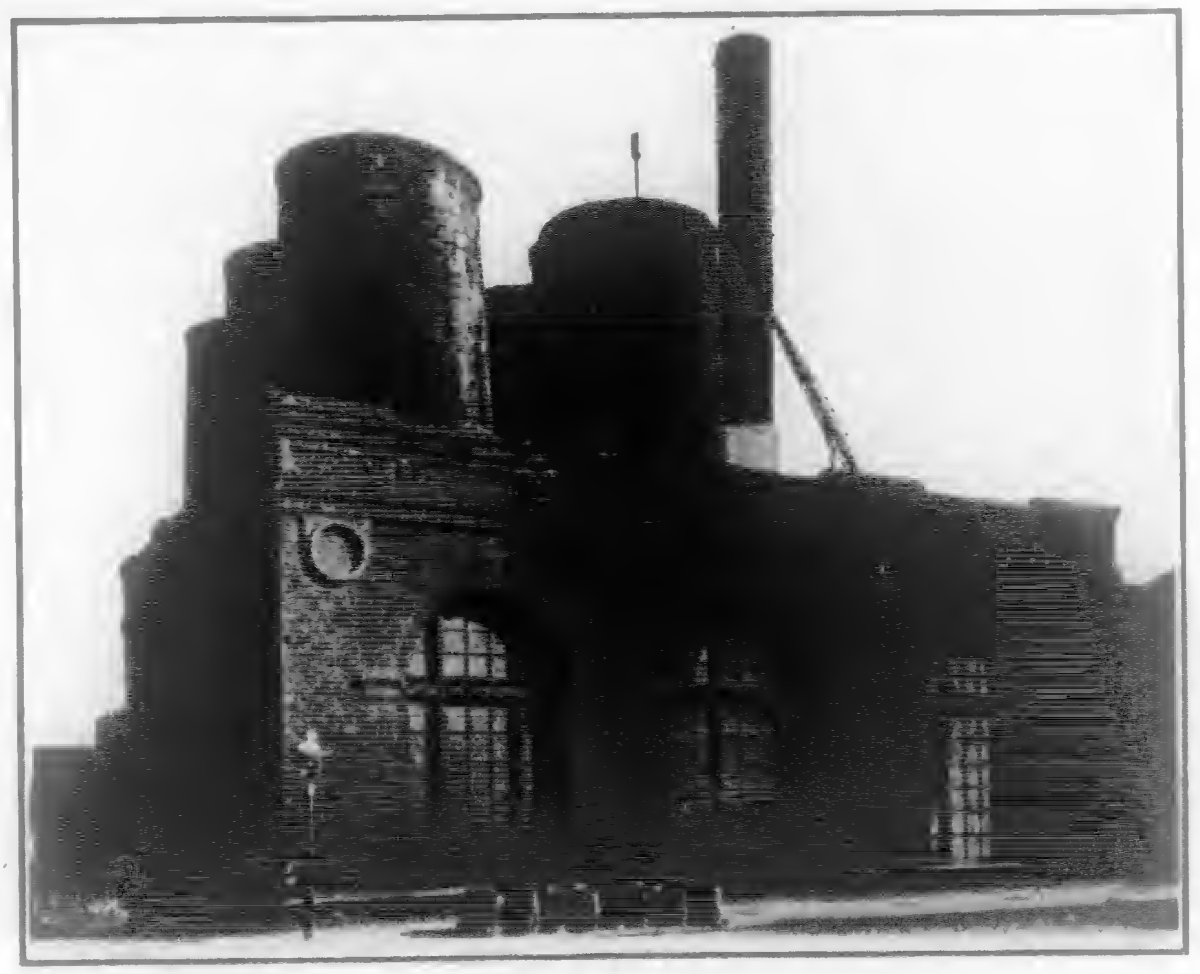
Columbia Stables
San Francisco



Metropolitan Laundry, San Francisco



Building for California Wine Association



Power House, Metropolitan Laundry Company
Frederick H. Meyer, Architect



Building for the Weinstock-Lubin Company, Sacramento



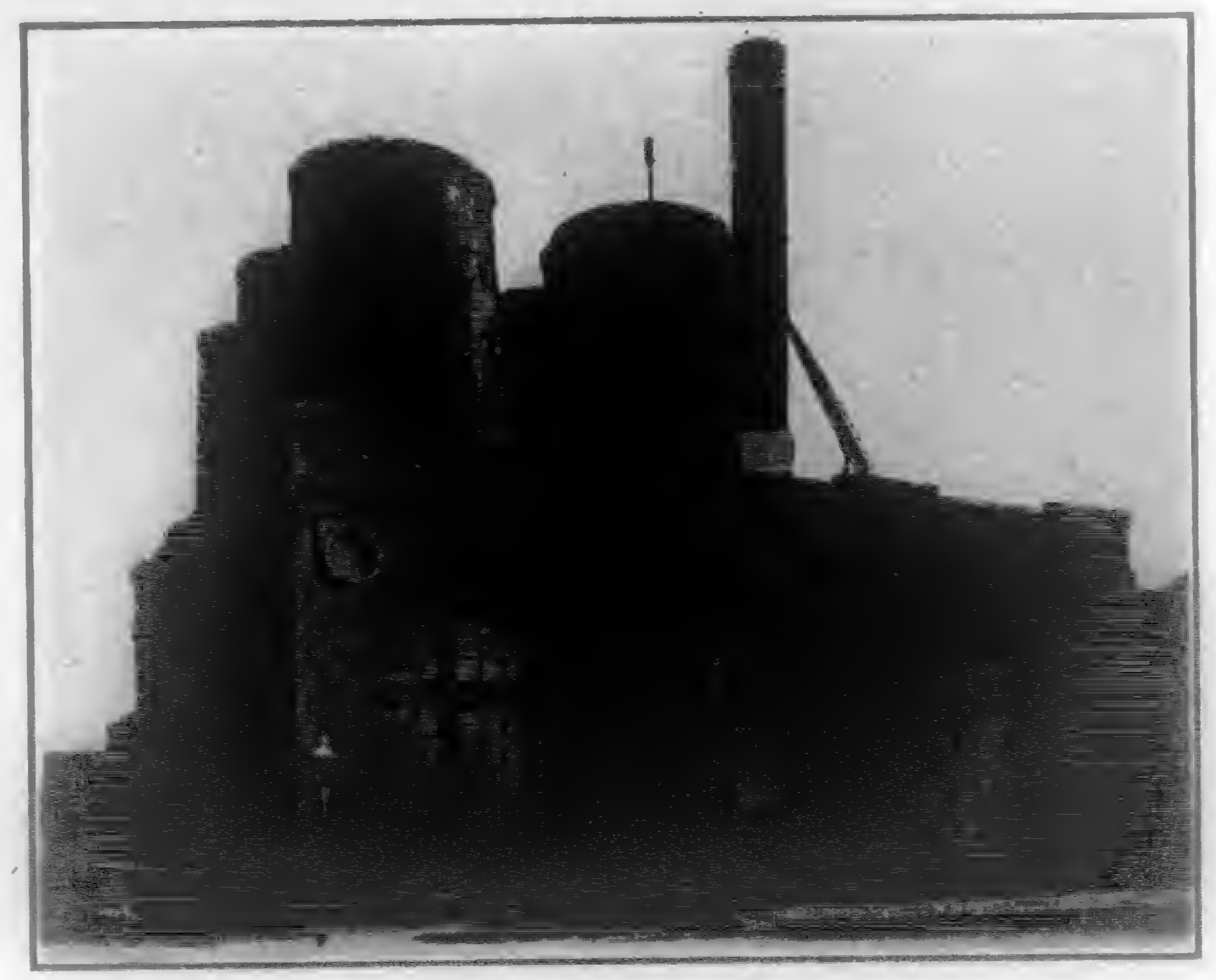
Columbia Stables
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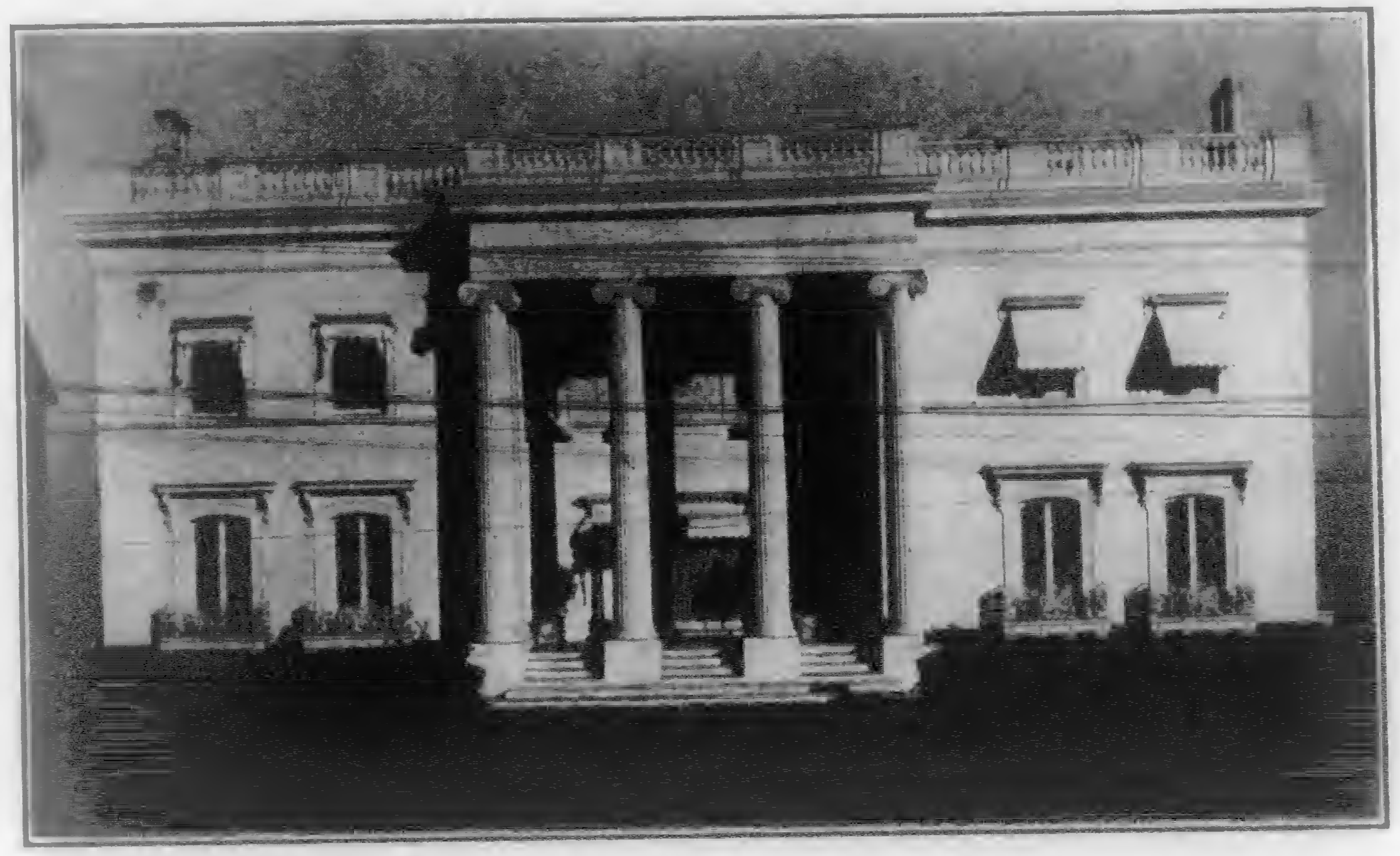
Power House, Metropolitan Laundry Company
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Residence of Frederick H. Meyer, San Rafael



Residence of Frederick H. Meyer, San Rafael



Residence for Mr. Rudolph Spreckels, San Francisco



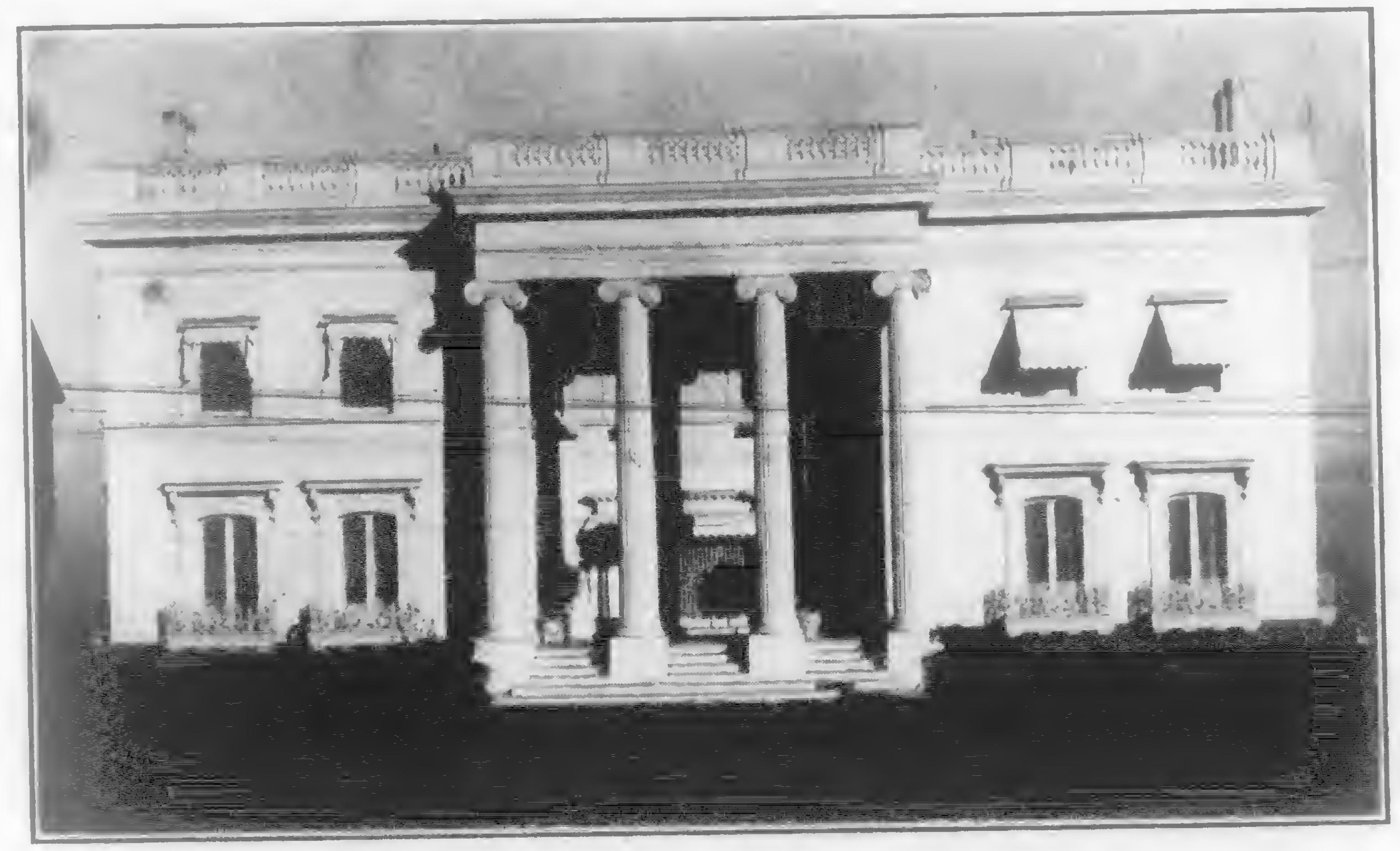
San Rafael Golf and Country Club
Frederick H. Meyer, Architect



Residence of Frederick H. Meyer, San Rafael



Residence of Frederick H. Meyer, San Rafael



Residence for Mr. Rudolph Spreckels, San Francisco



San Rafael Golf and Country Club
Frederick H. Meyer, Architect

The Mountain Residence of Edward H. Harriman

Both before and after the death of Edward H. Harriman, there appeared in the daily press frequent allusions to his palatial country estate at Arden, N. Y. Only passing reference was made, however, to the architectural features of the Harriman house, designed by Messrs. Carrere and Hastings of New York. In view of the prominence of the man and the extensive scheme which he had evolved for the improvement of Arden Place, a brief description of the estate would seem at this time of special interest to the architectural and engineering profession. In the following article will be found extracts of a splendid paper on Mr. Harriman's mountain residence, by Lucy Cleveland, and written prior to the magnate's death for Domestic Engineering:

THE mountain residence of Mr. E. H. Harriman stands thirteen hundred feet above tide water. Mr. Harriman has harnessed a mountain. "One" mountain? It is a plural plentitude of beauty. Mr. Harriman collects peaks as other men pottery. Stand, at Arden, and sweep your gaze around the billows piling up in a grand array of green. It is all the mountain estate. The estate is 40,000 acres. The view is one of those great vistas that one hoards and heaps and keeps forever. You are nearer the moon in your hunger for it on the crust of this earth. There is not a hint of human habitation in sight around all the ampitheatre of mountains; there is not a breath save from the breast of forests; there is not a sound from the twilight of green crags. But you hear the heart of Solitude beat! Afar, is the range of the Shawangunk Mountains, and the Ramapo Mountains, and Dunderburg Mountain. To the northwest, the Hudson Highlands and the Catskill range. Far, far below glisten the lakes that give "the countless dimpling of the deep" of the Greek poet to the prodigal landscape. And what when the purple light fills the enormous wine-cup of the hills, and when the constellations are the ceiling of the Courts? The site was chosen for its beauty. Yes, but chosen, primarily, for its grip upon the prize which the gods (after some intricate and delicate debate interrupted by the voice of Juno too intent upon her mirror) decided to set first in the roaring trade of human endeavor—Health. What pure winds of heaven on these Arden heights. What sunlight; and what air!

It has been said by one of the great thinkers of the world that external beauty must begin at the most external point. The driveway—which is 1,000 feet long, a macadamized road with footpath on either side, and planted with grass and trees, and at whose entrance is a stone-lodge, and lodge-keeper, strikes at once the noble note of approach to a notable house. Along this great sweep of driveway we have the appetite whetted on a constantly increasing scale for the pageant of beauty. The coup d'oeil burst upon us—the Arrival Court with its observation terrace of the double stairways of stone; the House; and beyond the house the lily fountain court beyond which is seen the enormous terraces and Pergola Court of the great Pool. The view of these terraces as one turns the corner of the house, is overpowering. What a residence! It is designed by the celebrated architects, Messers. Carrere & Hastings, of New York, so noted for their monumental work. The harmony in this wonderful residential architecture, steals upon you like a fragrance. "Harmony," said Beethoven, "is the secret in all great Art." And it would seem that he knew! In all this stone amplitude not one false note has been struck. The courts and terraces show what advantage has been taken of a mountain-top opportunity. The house is Modern Renaissance, based on the Eighteenth Century. But really a new note in architecture has been heard, an intellectual feat which will be historic. As in the old castles of the Tyrol, the building was the outgrowth not only of the need but of the location. The house arose from the rock, expresses the rock, is the rock. The terraces are the slopes that arise upon our dreams.

The residence is built entirely out of the stone of the mountain—a unique idea. In the diamond-shaped adornments of igneous rock set in the walls of the house, is seen the result of old volcanic action in the Paleozoic Age when the Jura arose to being, when all this family of mountains around us at Arden were born into the azure by some throe in the bosom of Nature. The house and its Courts and Terraces is probably the noblest residential domain in the world owned by a man who has not prince-long titles to his name, but who counts as his best inheritance the blue blood that helped to make his country's flag. Over the entrance door of the house is the family escutcheon. It is carved out of one block of this mountain stone; and it weighs nine tons. Of the splendor of the interior plan? The great entrance hall of Utah stone has a trussed ceiling and oak wainscot. At its huge fireplace, Jack could have sat with a cup of content after he had finished his work on that hard Giant job. Architecturally, this Entrance Hall recalls the Hall at Hatfield House (seat of the Cecils). The "hall" is a feature handed on from times beyond the dim Gothic, for in the "hall" at Ithaca, Odysseus slew the cuitors; and in the "hall" at Tiryns, kings dispensed judgment that laid the foundation of Greece's immortality. In a gallery directly over the entrance of the Arden Hall (the "gallery" of the king's minstrels from Erin to Arden), there is a grand organ. The echo organ is placed in the adjoining loggia of the interior Court. The interior Court has a fountain and loggia. Technically, the "loggia" is a roofed corridor or gallery, forming a protected sitting-place out-of-doors. It is a feature of the Italian palazzi. This interior Court will be walled in with glass in winter. Beyond the reception room of the bow-window is the dining-room with its loggia, and other stately loggia that form a sun-room enclosed with glass, so that one will seem to sit out of doors, in December. These rooms, and the living room, whose tapestries are by Mr. Albert Herter, open on the lily Fountain Court above described. The vista through the great entrance hall across the enormous loggia to the terraces and pergola of the rose-vines, is startling in its brilliance.

On the second floor are the library, and Mr. and Mrs. Harriman's suites with their boudoir and bathrooms (the bathrooms as large as the drawing-room of a town residence); and the family bedroom suites with their bathrooms; and the many guest chamber suites with their bathrooms; and the breakfast room; and in a compact corner of this second story, Mr. Harriman's office, and the Secretary's office, bedroom and bathroom. There are 69 rooms in the residence, 13 halls, and 30 bathrooms. Every room has hard wood floor of the rounded corners. Everywhere, in every room, large open fireplaces. The windows are as generous as Lord "Dick" Whittington's in his Guild-hall; and we doubt not that at these big fireplaces a place will be made for the dear Magic Cat.

The servants' quarters and the working quarters of the house we find distributed between the first and second stories. Back of the dining-

room are the many pantries that open into the kitchen and the servants' hall and the kitchen pantry. The grouping of the cold storage rooms near the kitchen is admirable, and a better plan than in the Senator Clark house where these were distributed through the basement. The laundry, with its large drying-room, adjoins the kitchen. In a wing beyond the servants' hall, are some of the men servants' rooms.

* * *

The writer concludes with a detailed description of the heating, ventilating and electrical plant, designed by Messrs. Hollis French and Allen Hubbard, of Boston.

The floors in all the working quarters of the house are of terrazo. The ironing and drying will be done by electricity. The engineer's quarters in the basement have bathroom with overhead shower. A fan under the Dutch hood of the kitchen range draws up all the odors of cooking through the chimney.

The supplies(and coal) come up the mountain by the inclined railway, and to the house by a little track (that runs into the Arrival Court). This track has chutes to the coal room in the basement.

The attic is brick lined—terra cotta bricks. It has a slate roof, with copper leaders. There are unique snow guards on this slate roof—hooks—that hold the snow until it melts. The snow cannot drive downwards in dangerous plunges.

* * *

What a pity Mr. Harriman's life could not have been spared! Heard through all the vistas of the gardens, and along all the halls and heights, there spoke the greatest thing in the world—the voice of family affection. To sustain these close, strong, matchless links, this house, after all, was built. Beauty is good, and science is the call, but the most sacred thing on God's earth is the family bond. As we look again towards the crown of hills, we see what the Creator thinks where peaks are families; altars, the Azure[

* * *

55,000 Ton Brick Building Moved.

A notable and extraordinary feat in the line of building moving was accomplished recently at Springfield, Mass., when the public library building, a three-story brick structure, was moved 200 feet to make room for the new Carnegie library which is to occupy its former site. The old building is to be demolished as soon as the other is completed.

The weight of the building is estimated at 55,000 tons, and therefore its moving was rather unusual, although it was accomplished without accident and within the promised time. It was moved the required 200 feet in 20 days by 12 men turning screws.

After the building was jacked up on some hundreds of jack-screws, the foundations were removed, and the weight let down onto twelve 100-foot I-beams which rested on 1,000 steel rollers, 2 inches in diameter, placed as near together as possible.

The rollers rested on 12-inch timbers faced with long strips of iron ¼ inch by 6 inches.

Horizontal screws pushing against the upper timbers, and held by blocks chained to an anchorage furnished by the substituted under-pinning, moved it back at the rate of 10 feet a day, or about one-quarter of an inch a minute.

Waterproofing*

By CLAY PAUL GOODING.

WATERPROOFING, as the term shall be used, is the protection, against water, of tunnels, subways, railroad bridges, pipe tunnels, ornamental bridges, and excavations such as basements, elevator pits, railroad track scale pits, and others.

To narrow the subject a distinction is made between waterproofing and damp-proofing. The former may include those cases, usually below ground, where a water pressure is met, and the latter, those cases, both above and below ground, where only dampness is found. Though we cannot locate a line between the two, it will be seldom difficult to classify a given case.

It is unfortunate that many excellent dampproofing materials are advertised for waterproofing, since they are wholly inadequate to meet a hydrostatic pressure. Too often we find over zealous salesmen urging their use far beyond the purposes intended by their inventors or manufacturers.

All the various methods now offered for meeting water pressure may be put in one of two schools—the rigid and the plastic.

The rigid school includes all those various chemicals, clays, soap, alum, etc., which are mixed with the whole mass of the concrete; a carefully troweled neat cement; patented cements which are put on the inner or outer side; various washes and liquid compounds which are applied to the surface; all damp resisting paints, many of which use the word "waterproofing"; and mastics; in short, all those methods by which the waterproofing material becomes a part of the concrete, or is so used that it must crack when the concrete cracks.

Although various materials are used, the plastic school includes only one method. This is the old pitch and felt method. One company which has recently come into the field has aptly called it the "membrane method."

Let us look first at some of the principles underlying, and some of the methods used in the rigid school.

Much interest is being evidenced at this time in attempts to obtain an impervious concrete by mixing foreign materials with it. One cannot read the reports of some eminent engineers without realizing that a partial, but only partial, impermeability can be had, and this at a considerable risk especially when controlled by men not thoroughly familiar with the laboratory side of the problem. Even a partial impermeability is often to be desired. When using chemicals it is important to consider not only their immediate effect, but also what their effect may be after a number of years, upon both imbedded steel and the concrete itself. We quote from Mr. Samuel A. Brown, of Philadelphia: "It is well known to some engineers that the presence of sulphates and alumina in cement is not desirable above certain limitations, owing to their accelerating action on the set, loss in ultimate strength, possible expansion of the sulphates when used in water, and their disintegrating effect in sea-water." And, further: "The wisdom of using any substance to be incorporated in the concrete, especially if chemically active, should be very carefully considered, for the reason that present-day cement is of such high chemical activity that any unbalancing of the chemical equilibrium may result in ultimate disintegration." Mr. Sanford E. Thompson, M. Am. Soc. C. E., clearly points

*Paper read before San Francisco Chapter, A. I. A., September 19, 1909.

out that even if a hydrated lime should produce impermeability, the structure will not be water-tight unless the material has been perfectly mixed, perfectly placed, and construction joints, and shrinkage, and other cracks are guaranteed against. After a series of experiments, he used on a certain reservoir 5 per cent of hydrated lime with a 1-2-4 concrete. The 5 per cent is, in quantity, that per cent of the cement. It is added to, and does not replace other materials. In this case seepage occurred through joints formed between different days' work. Mr. Richard H. Gaines, chemist, Board of Water Supply, City of New York, has made many valuable experiments with colloidal clay and other materials. He concludes that additional tensile and compressive strength can be secured, and permeability greatly lessened by replacing 5 to 10 per cent of the sand with a properly selected and properly prepared clay. He directs attention to the importance of properly selecting and properly preparing the clay, as they differ widely. The clay should be mixed with the cement first. He states that "Continued experiments with alum and other salt solutions have given results that were variable and inconclusive." Mr. Myron H. Lewis, C. E., a consulting waterproofing engineer of New York, recognizes the merit of colloidal clay as a void-filler, but strongly favors compounds of a waxy nature because they possess the additional merit of being "Capillary negative."

A concrete may be perfectly sound and yet far from waterproof. In all concrete, however sound, there necessarily exist zones lacking in density and of at least slightly inferior quality. Attempts to stop water pressure are often made by increasing the thickness of a concrete wall, and then troweling it with a neat cement on either the inside or the outside, or both. This sometimes succeeds, but only where the pressure is not great. Perhaps it would be safer to say it appears to succeed, for the water is only retarded and usually makes its appearance after a year or more. The smallest possible hole in the exterior troweled surface will admit water, and it will continue to enter until all the large interior voids are filled and the pressure banks up against the inner troweled surface. Somewhere in this surface a weak spot will be found and the water forced through. Under such circumstances it will be practically impossible to free the wall from its soaked condition. The slightest crack in the concrete will only hasten this condition.

There are numerous cases on record where water in concrete has done no apparent harm to imbedded steel, and there are others where it had materially injured it. One case is reported where but a streak of rust was found where the steel had been. Considering the short history of this construction it is only safe to say that we have not sufficient data to determine the conditions under which it would be safe to trust the imbedded steel under the action of water, if at all. The formation of a small amount of rust would entirely destroy the bond, and the danger from such weakening needs no amplification.

The report of a committee to the Structural Association of San Francisco, upon the corrosion of metal in cinder concrete floors, made September 11, 1906, contains: "Rust spots occur in concrete and when such spots are in contact with the steel the corrosion is severe." This refers to floors which had not been exposed to rain since April 18, 1906, and they found a more severe corrosion in floors that had been exposed. In some cases the expanded metal had been entirely destroyed. They say, in conclusion: "The extent of the corrosion is great enough to

seriously endanger the safety of the floors, and it is not probable that the floors would have supported their loads from more than one to three years longer." In this connection it is interesting to note that insurance companies are granting reduced rates on factory and warehouse buildings where the floors are properly waterproofed; and this applies to concrete floors.

Within very recent years the phenomenon, electrolysis, has seriously engaged the attention of engineers and architects. Its destructive effect upon the imbedded steel of our skyscrapers is no longer doubted. Insulation would therefore be a valuable addition to a waterproofing, but none of the methods in the rigid school afford any protection whatever against electrolysis.

Perhaps a half-dozen years will encompass the life of most methods of the rigid school. It has been reported that at least one of these is found to have lost its efficiency after about four years. Being ignorant of the constituents of the various washes, paints, patent cements, etc., that are offered, would not their use entail the additional risk of their degenerating, as well as their chemical effect upon the steel or concrete itself?

With regard to the patent cements that are troweled on to the interior surface of a wall, it is claimed by many men of experience that they have had equally good results from the use of soap and alum. Others say that the same amount of "elbow grease" put into troweling of a plain, neat cement will do every bit as much good.

It is noteworthy all of these methods have at least two weaknesses in common; the slightest crack in the concrete destroys every one, and not one affords the slightest protection against electrolysis.

And now let us take a look at the plastic school. Its one method, pitch and felt, has been used in the United States for more than forty years, and so well has it stood the test that where severe water pressure is met, it is in use today in every one of the really big jobs now in course of construction, or recently constructed. These include the tunnels under the rivers at New York, the Detroit River tunnel, the New York Central and Pennsylvania Railway terminals in New York City, the new Boston subway, the new subways in New York and the Macadoo terminal. To these might be added the old subways of New York and Boston, the South Terminal Station of Boston, tunnels at West Point, and nearly all recent United States fortifications, and with but few exceptions all the deep sub-basements in lower New York. The old Park Avenue Railway tunnel in New York was waterproofed with pitch and felt about thirty-seven years ago. The excavation for the New York Central Station required destruction of a part of this tunnel about four years ago. The pitch and felt that had been put on the walls thirty-three years previous and had given perfect results all that time, was taken off in the presence of two eminent engineers under whose supervision it had been placed. They found it in perfect condition, and so did Dr. Pease, then chemist of the Pennsylvania terminal, when he examined it for tensile strength. In the face of this and other similar tests of time it is not surprising that those boards of engineers which are now constructing our largest projects should all select the pitch and felt method.

In general, this method involves the construction of a complete and unbroken sack, sleeve, or blanket of plastic and elastic waterproofing material, together with its protection from the air and from anything which might tear or cut it. When looking for a waterproofing material it was found that certain asphalts and coal tar pitch are impervious to water,

are unaffected by water, and remain in perfect condition if kept away from the air. It was found also that they are affected by heat and cold, and possess the weaknesses of running and cracking. A high-class saturated felt cures both of these weaknesses, and was therefore used to enable engineers to take advantage of the impermeability of asphalt pitch and coal tar pitch. The relatively high percentage of oil in the saturated felt keeps the mass plastic, as well as enabling us to build up a large and very strong mass which will bridge the natural cracks in concrete. The felt, therefore, is a purely incidental though a highly important feature of the construction. It enables us to put the asphalt in quantity where desired and to keep it there. The felt should be made to carry as much asphalt as possible and the bonding of the felt and pitch should be so perfect that the identity of the individual sheets is practically lost. A properly constructed mass, when analyzed should show about 80% to 90% asphalt and 10% to 20% naked felt, or carrying material.

For convenience it is customary to describe the thickness of a waterproofing course by the number of plies of felt; but this should not be allowed to mislead one into thinking of the felt as the waterproofing. It is the asphalt which really does the work. To meet a pressure of water it is customary to use from 3 to 14 plies of felt with the asphalt. Ten plies have very commonly been used under severe conditions; although it is probable that 4 or 5 will meet most present requirements in San Francisco. Experience alone can determine the amount to be used.

Regarding materials, we find various well known asphalts, coal tar pitch, and secret process asphalts. For the purposes of San Francisco architects and engineers we need consider only California asphalts. It is unfortunate that the brevity of this article will not permit a more extended consideration of the subject. Until the last two or three years all California asphalt was made only as an incidental or bi-product, and was necessarily far inferior to carefully prepared natural or rock asphalts. At present there are four or five places where it is manufactured as a primary product and with care. Among these there is a noticeable choice, depending upon such things as the quality of the oil used, temperature at distillation, intelligence of men in charge, consistency of final product, etc. While in the East the writer took occasion to learn the opinions on California Asphalt, of a number of prominent engineers experienced in waterproofing. Reports of their chemists showed that a first quality of California Asphalt ranks in no wise inferior to the best imported asphalts, such as Burmudas which has long ranked as a standard for waterproofing. The first quality asphalt must not be confused with those bi-products, from about forty oil refineries, which are on the market.

Under the head of felt may be included burlap, Irish flax felt, cotton and wool felt saturated with either a known asphalt, coal tar, or a secret process asphalt. A first quality cotton and wool felt, saturated with either known first quality asphalt, or coal tar, and usually described as "weighing after saturation not less than 14 pounds per 100 square feet," is the old line article which has been used on all of the big jobs of the past and stood the test for forty years.

By engineers of experience burlap is used only at exceptional places where a special strain is expected, and then always carefully protected by several sheets of asphalt and felt. Burlap is made of a vegetable fibre and will rot quickly if water gets to it. Because of its construction it will not accept a saturation; but when its interstices are filled and its

surface is coated it is often said to be saturated. It is difficult to handle and should be thoroughly mopped with asphalt before being placed. There is on the market at least one patented well dipped burlap.

Irish flax felt differs materially in its construction and is thoroughly saturated with preservative oils. When mopped with a heavy coat of asphalt it possesses great strength. In many places it could be used to better advantage than burlap and for the same purpose. To get the best results this also should be covered with asphalt and several plies of wool felt.

As most local problems will be in the nature of basements we will mention these only. The waterproofing course may be built on the outside, the inside, or through a wall; but one place has certain advantages over another. The outside has the marked advantage of being much less expensive, and also of protecting the imbedded steel in the wall from both water and electrolysis. It has a possible disadvantage in case of an unusual settlement which causes the wall to drop far below the floor. At their parting the waterproofing would be cut off, and it would be more difficult to mend perfectly, than an inside course. The inner retaining wall for the inside course need be only strong enough to withstand the pressure of water, and in many cases a 4 inch brick wall is sufficient. The details connected with this work are too numerous to enter into here, but in all cases certain fundamental principles must be followed. A complete and unbroken sack must be obtained. The work must be done with asphalt; the felt being regarded only as an incidental feature.

Notwithstanding all that has been said it has been the universal experience where waterproofing is being done for the first time that failures are common with the pitch and felt method. This is always due to the inadequacy of the specification together with the inexperience of the labor. It is extremely difficult to procure or create experienced waterproofers. They are invariably roofers whose years of experience must be materially modified. Nevertheless experienced waterproofers are necessary, as nothing short of perfection is sufficient. Water is no respector of errors.

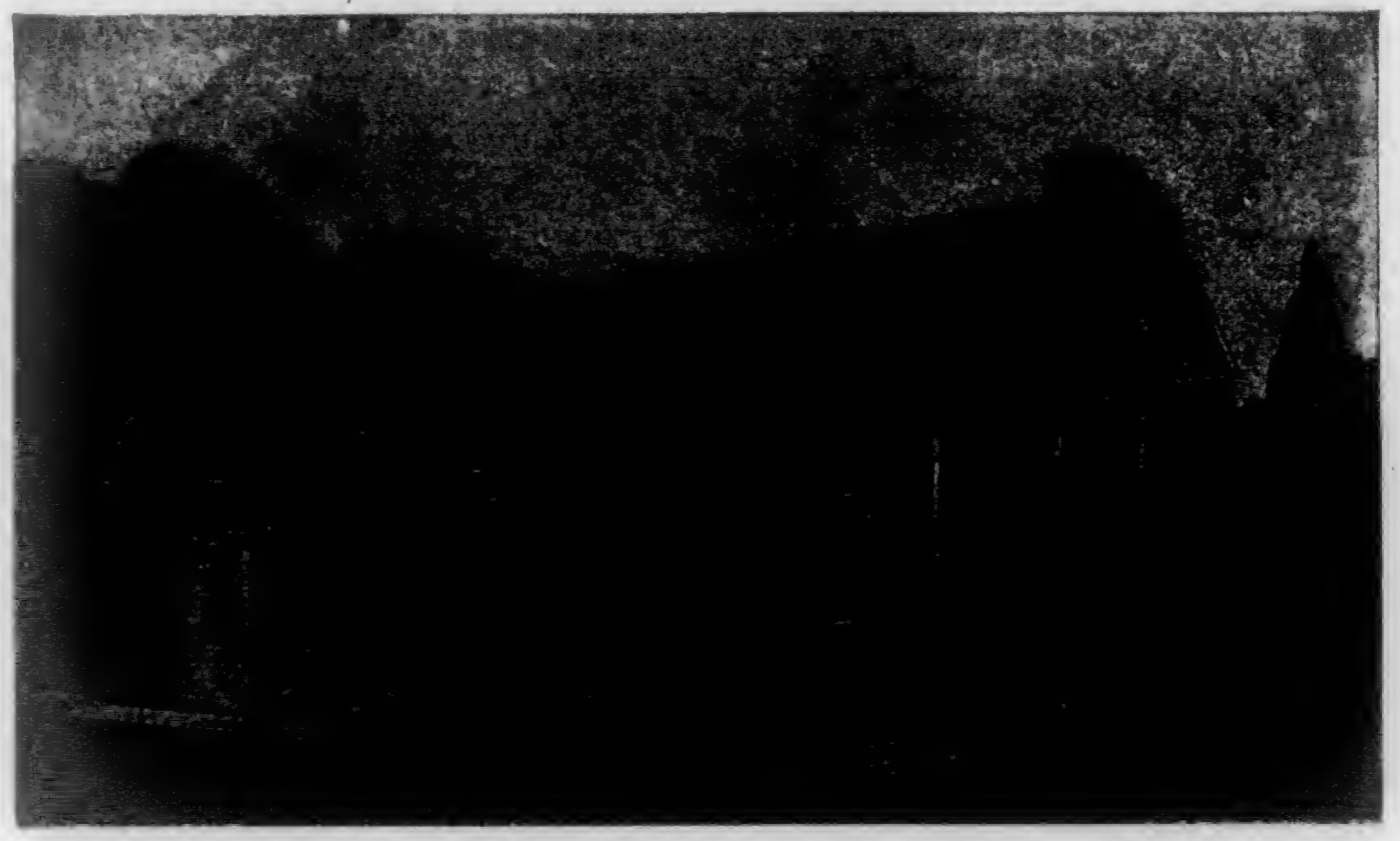
By men of experience guarantees are seldom called for, as they have learned the inadequacy of this method of obtaining results. A careful inspection of guarantees given will satisfy one that they are practically useless. The Courts (114 Fed. Rep. 942) have exonerated the contractor guarantor where he applied materials according to specifications. The only safe method is to have a comprehensive and detailed specification carried out by competent men under careful inspection.

* * *

Reinforced Concrete Railroad Ties

Reinforced concrete ties are being laid by the Los Angeles railway company for the purpose of testing them. About 320 ties will be laid, the period necessary for testing being estimated at from two to ten years. The company has timber growing for future use as ties, but will use the reinforced concrete if it proves efficient.

Concrete ties have also been laid by the Southern Pacific company in the freight yards at San Jose. They have been in use more than two months and according to officials of the road are giving splendid results.



Elevation of Concrete Block House
R. C. Ostergren, Architect

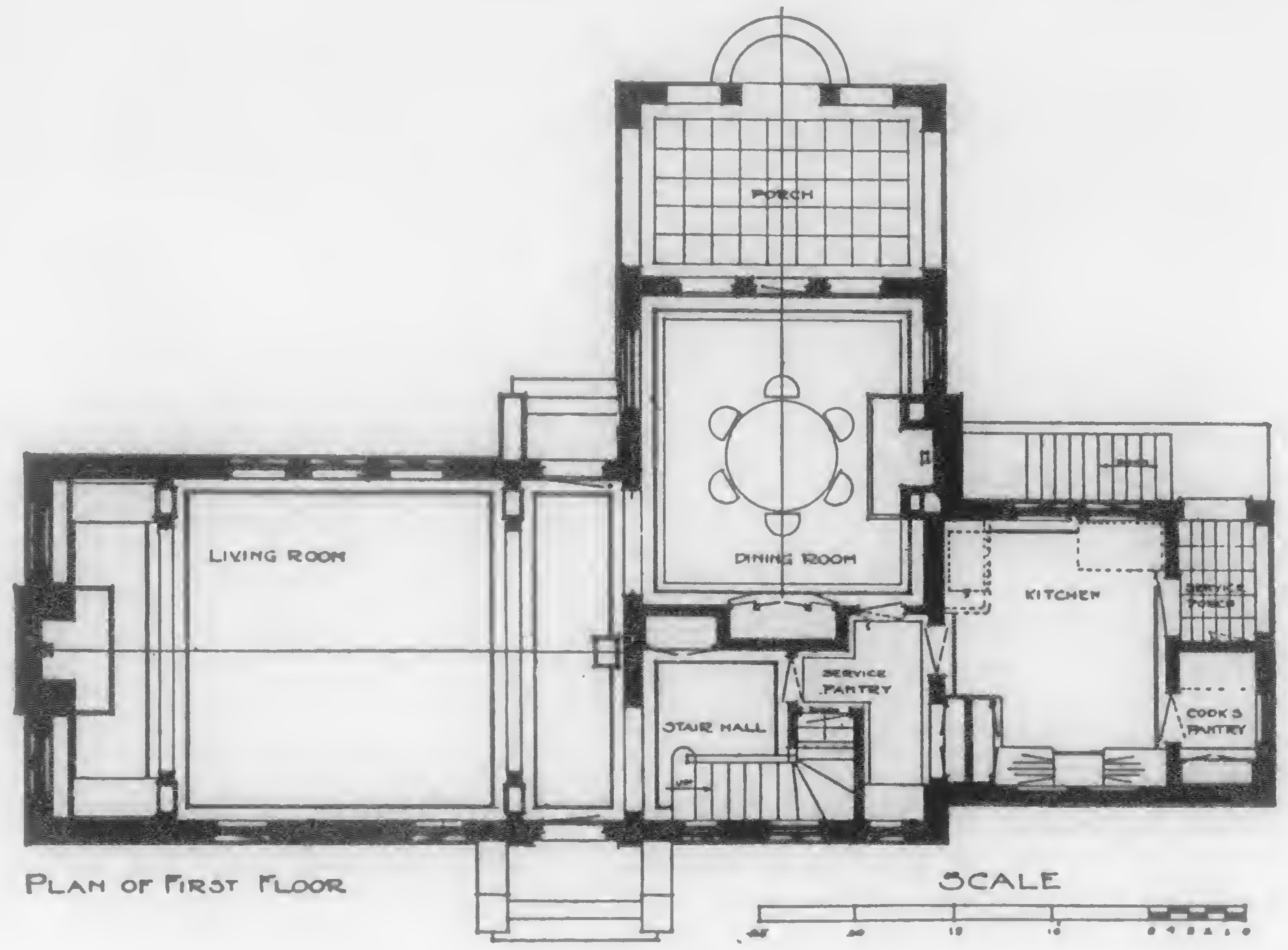
Prize Plan of a Concrete Block House

TO PROMOTE the use of concrete in house construction, the Universal Portland Cement Company, of Chicago, recently offered prizes ranging from $200 to $25 for designs, which were submitted in a competition of the Chicago Architectural Club. The designs were for suburban houses to be constructed of concrete and to cost $8,000, and the competition was open to all architects and architectural draftsmen residing within a radius of fifty miles of Chicago. The competition attracted a great deal of attention among architects. The terms of the competition provided that each building was to be planned for a suburban lot with a north frontage of 100 feet and a depth of 250 feet, practically level and without trees, assuming that the owner would spend enough money on the grounds to plant a number of fine, large trees where they would be most effective in relation to the building, as well as an abundance of fine shrubbery and flowers.

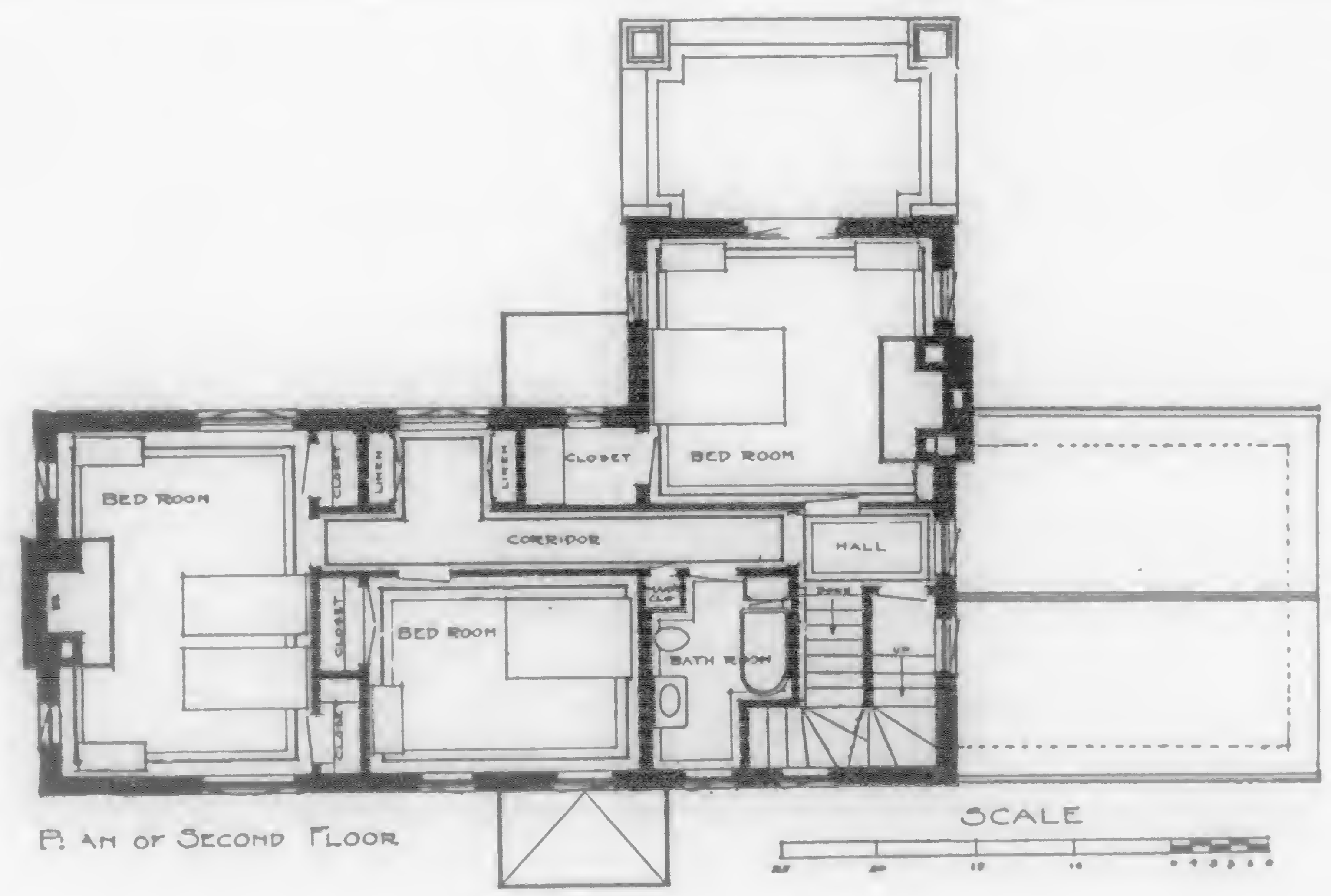
Other provisions were as follows:

"The first floor must provide a hall, a good sized living-room, dining-room, and convenient kitchen and service arrangements. The second floor must have at least three bedrooms, with at least one good closet for each bedroom, one bath-room, and a recessed linen case in the hall. The attic must have servant's room and bath. A cellar is necessary under the entire house.

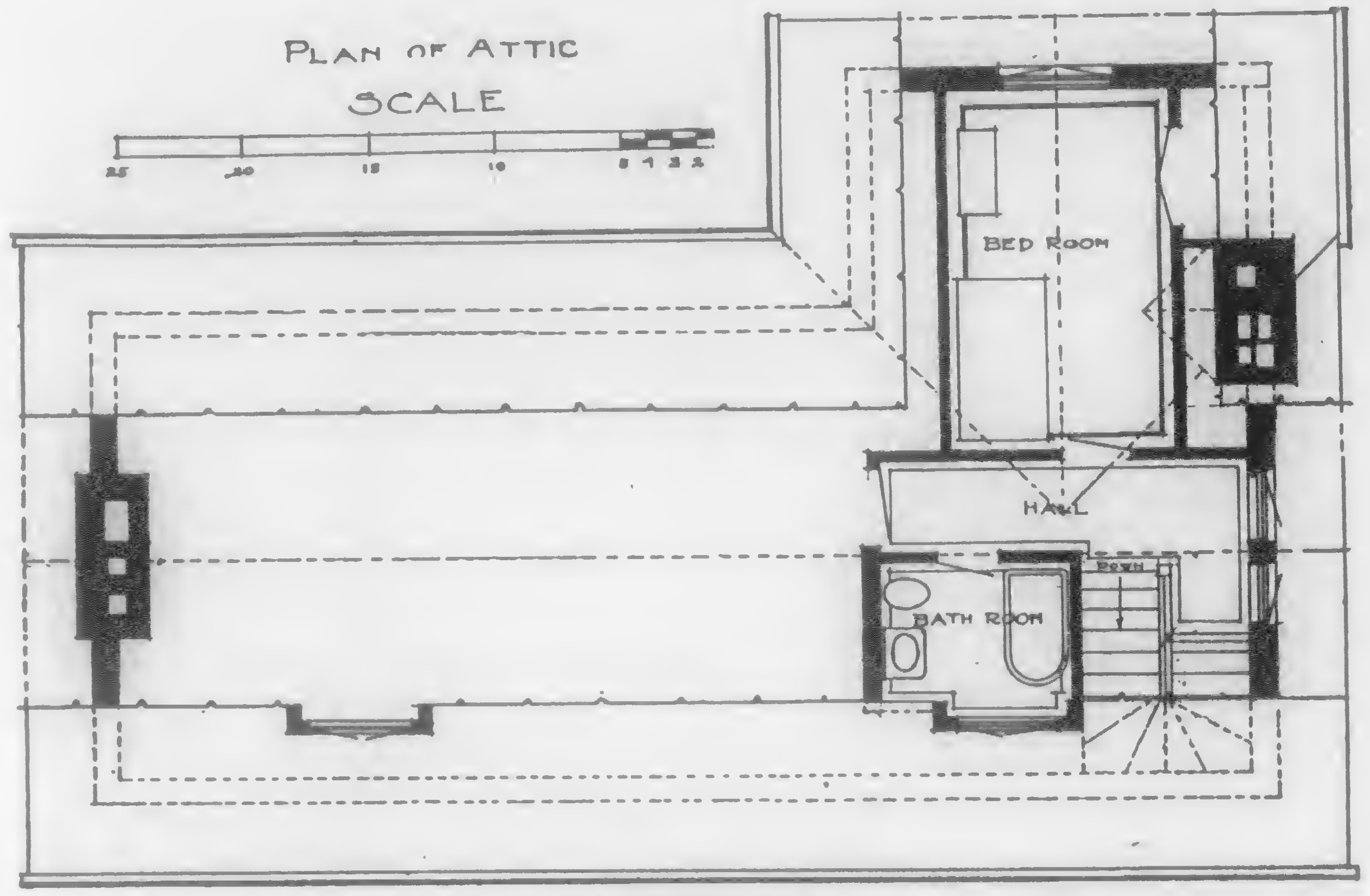
"The foundations and exterior must be of either plain or reinforced concrete or concrete blocks; if of concrete blocks the so-called rock face must not be used. The exterior surface of the walls may be finished in any manner, except by plastering, which, in the opinion of the designer, will produce in the executed building a pleasing effect, and which can be readily obtained in actual practice. The sparing use of color in the form of pigments or inlaid colored tiles is admissible, as well as decorative detail in relief which can be cast in molds. Eaves and gutters, as well as the walls, may be of reinforced concrete at the option of the designer.



First-Floor Plan



Second-Floor Plan



Attic-Floor Plan

The floor construction shall be of reinforced concrete. Interior columns shall be of concrete, either plain or reinforced. Interior partitions shall be plain or reinforced concrete, concrete blocks or cement plaster on metal lath or wire mesh. The stairs shall be of reinforced concrete. The roof construction shall be either reinforced concrete or structural steel covered with tile, slate or other fireproof material. No wood is to be used in the building, except for door and window frames and other interior finish."

Design No. 1, which received first prize, is by R. C. Ostergren and the following brief description and estimate of cost is given by courtesy of the Universal Portland Cement Company and Cement Age:

Walls and chimneys to be plain or bush-hammered concrete blocks, laid up in alternating wide and narrow courses. Inside of all exterior walls to be covered with R. I. W. and plastered. Concrete blocks are also to be used for basement walls, piers and partitions. Basement walls to be waterproofed, partitions to be plastered directly on the concrete blocks.

Footings to be concrete. Basement floor and floor in dining room porch to be concrete with cement finish. All flues to have tile lining except kitchen vent.

All floors to be reinforced concrete with wood floors on top, nailed to sleepers imbedded in the concrete. Building paper is to be used between floors. Balcony and porch floors to have cement finish stained.

All sills and steps to be of concrete as well as hoods over entrances. Same to be stained little lighter than general tone of the house.

All lintels to be of concrete block reinforced with iron rods in lower chambers of blocks. Roof of reinforced cinder concrete with asbestos shingles nailed directly to concrete.

Oak trim in main rooms; yellow pine in remaining rooms. All rooms to have continuous head casing with corner casings in main rooms. Casement windows to be used throughout. Same to swing out except in basement, where windows are to swing in and up. Cubic contents, 40,075 cubic feet. Estimated cost, $7,967.

Painting Cement

Lessons from Experience for the Contractor, Painter and Decorator

By E. J. LININGTON.*

IN MOST of the articles that have been written on this question, a great deal of time and space have been given to the chemical side of it, and, while admitting that it is purely a chemical question, yet I have tried to put it in such a way that it will appear as simple as possible to anyone, even though he may not be conversant with chemistry. Now, to simplify this matter, I have put this question under three heads, viz:

1. Painting new cement work.
2. Painting cement structures of six months' standing.
3. Painting cement structures, or floors, that have a loose or sandy surface.

Now, taking up No. 1 question first—and I think it is the most vital one—I find that the chief trouble lies in the fact that it is impossible to paint a new cement structure with oil colors, so as to retain these colors, without first neutralizing the alkali that is formed in the setting of the Portland cement, for it is well known that in the setting, or hardening process, a certain amount of lime is set free in a hydrated condition. This is practically an alkali.

Now to take our cement building (and I have taken it for granted that it is in a dry state, for otherwise I am of the opinion that no treatment of any kind will be of use), the question that comes to me is: How best to neutralize this alkali, and so render the surface fit to take on an oil coating? I will try to give you several solutions for this trouble, and will state which, in my opinion, is the best.

First. A solution of dilute muriatic acid has been used very extensively for several years, but it has been proved that this solution is not only harmful to the cement, but also, unless great care is taken with it, harmful to the succeeding oil coatings.

Then we have a solution of dilute sulphuric acid, and, while this acid is somewhat similar in nature to muriatic acid, yet the results to the cement, and also to the oil coatings, are not as harmful. In either of the above cases it is better to give two coats of the wash, and then allow it to stand for several days, and then go over with a liberal wash of water, which will take away the salt (calcium chloride) which will have formed on the surface as the result of the former applications.

Then, again, we have a solution of carbonate of ammonia, which is procurable in lump form and is soluble in water, and I find that two coatings of this will neutralize the caustim lime and leave the surface ready to paint without the water necessary in the two former solutions.

Now we come to what I consider the best solution of all, and I must give Mr. Chas. Macnichol, of Washington, D. C., credit for same. Mr. Macnichol gives this solution as the result of practical experience on quite a large scale. We have tried it, and can certify as to the good results to be gained from its use.

The method consists of coating the cement surface with a solution of zinc sulphate and water, mixed equal parts by weight, and then allowing three days to elapse before coating with the oil paint. The use of this

*Contract-Record.

solution on the cement causes a chemical reaction on the hydrated lime that results in the formation of hydrated oxide of zinc and gypsum, which is harmless to linseed oil paints, and does no damage to the cement surface.

Now, I have tried to put before you these several solutions in their different character. There are also several other remedies used—some good and some of not much use—among which may be mentioned ordinary vinegar and carbonic acid water.

I think that the first question may be safely passed over. Now comes the second question, and with it the third one also comes before us. As you know, we have had trouble, and a lot of it, with the paint peeling off the surface of the building or floors, and that after the alkali has been neutralized.

This is caused to a great extent by the fact that sufficient cement was not used in the mixture. This leaves the surface in a loose or sandy condition, and to my mind this has caused more trouble than the first question. I have given a lot of time, and I have experimented with several of the washes that are put up by manufacturers and others, but up to last year could find nothing on the market that would stand a hard test. At that time I was called on to treat some floors in a large manufacturing building in Toronto which were in a very poor condition. I tried several of the prepared washes and used their own paints, and at the same time I gave a portion of the floor two coats of hot neutral oil having ten per cent. of Japan dryers added. The neutral oil penetrated quite a quarter of an inch into the cement, and dried perfectly flat. I let it stand for twenty-four hours, and then coated in the usual way, and I found that while the other samples wore entirely away, mine, although exposed to more wear than the others, stood the test in a splendid manner.

I have since used the oil on a number of different jobs, and found it a splendid thing. Just one year ago I was asked to paint some large cement columns in the front of a Toronto residence which had been painted by several firms, but each time the paint had crumbled away and fallen off. We cleaned off with sandpaper all of the remaining paint and treated with the oil, as above mentioned, and let stand for two days. I found that in some places where the former paint had partially remained the oil did not go dead or flat, and in these places we wiped clean with benzine and burlap and then we coated in the usual way, and to-day there is not a crack or blister on them.

Another of our Toronto conferrees, Mr. Knott, had a contract to paint a lot of cement floors in one of our colleges, and they also were in a loose, or sandy, condition. He did them in the manner I have stated, and recently we both examined them, and, although they only received one coat of the lead paint on top of the neutral oil, and were subjected to the hardest kind of treatment, yet to-day they are in a perfect condition.

In my opinion, any cement surface, after two months' exposure to the weather, treated to two coats of neutral oil, will do all that is necessary both to stop the discoloration and prevent the peeling of the paint. I would advise using the oil hot, and that 10 per cent. of Japan be added. My reason for this is, that the hot oil penetrates deeper than the cold oil would, and gives us a better foundation; then the Japan hardens any of the oil which may remain on the surface, otherwise it would sweat through the succeeding coats. I have also found that one or two coats of this oil applied in the ordinary way to cement floors, not only stops the dust from rising but helps for all time the life of the cement at very little cost.

Why Engineers Do Not Take More Part in Government Affairs*

By J. P. SNOW.

THERE are cogent reasons why some engineers should not enter the so-called political field. Many are salaried employees of the government, either municipal, state or national; and many are railroad or other corporation employees. To run for elective office is taboo among officials of the national government and it should be in a greater or less degree among salaried officers of all sorts.

A railroad man may be a church treasurer, a trustee of an orphan asylum, a member of a board of health or even of a city council or board of aldermen. This is so because the duties of such positions are generally performed between two days or between two weeks. The paid-for duties of the class mentioned require their time during working hours, with perhaps an occasional jump-off of a few hours or a day or two. The Biblical mandate that a man cannot properly serve two masters still holds true, especially if he engages for full time with one. The ethics of the case prevent him from accepting service with outside interests that requires his thought and time to an extent deserving pay.

Engineers not in the salaried class are certainly free, so far as ethics are concerned, to accept or seek office; but, as hinted by the said far-seeing past-president, they cannot eat a stand-up lunch all by their lonesome and win.

Engineering is said to be an exact science. Winning a nomination to an elective office in the United States of America is not. Our wretched lack of system for making nominations due to our daft ultra-democracy, precludes any one with a natural love of geometry, which is crystallized truth, from entering the lists. An engineer who finds geometry repugnant, as does the average law student, has missed his calling. Hence, to my mind, the scarcity of engineers, of the independent and consulting class, in the political field.

Every true citizen of this country believes that our system of government is the best on earth, but if he is fair-minded he will admit that there are rot-spots and sink-holes in our body politic that he greatly regrets. These blots I believe are wholly due to our non-system of nominations. A nomination by the dominant party is the election. Who makes the nomination and hence elects the candidate? We have a strictly regulated and totally useless caucus, but the real nomination is not there. The actual nomination is made by a little clique of self-appointed men who will admit no dissenter to their conclave. They wield a mighty power, but they act without authority and are responsible to no one. If the nomination is bad no one can be held accountable, for there is no way to get hold of the parties who did the trick. To be sure, any dissatisfied voter can muster a few brother malcontents and make a counter nomination, but the result is simply another irresponsible clique with no more authority and perhaps no better morals than the first. The whole scheme is loose and bad; it breeds bosses by its very nature and there should be no wonder that engineers, who are true to the essence of their calling, decline to frater-

*Discussion of papers read before the Boston Society of Civil Engineers.

nize with it. When properly constituted public bodies, who can be held responsible for their mistakes, shall select the nominees for all parties, I think engineers will no longer shirk or shrink from accepting nominations, provided they are free to engage in public service.

As executives, engineers naturally excel; as law-makers, I have grave doubts of their capacity. For instance: The Boston Society of Civil Engineers has a system of nominating and electing officers; this is far better than the lack of system prevailing in our states and municipalities, for it always gives us good officers; but I think it the worst "system" that I have ever observed. The fact that, under it, the Society is well governed speaks volumes for the self-governing instincts of our members. The vagaries of our system, retained for so long a time, considered with the constitution-tinkering habit of the American Society, show what blockheads engineers are at law-making. The smooth working of both societies shows their superb executive and law-abiding possibilities.

* * *

Glass Bricks

GLASS bricks are not gold bricks. Germany uses them for building purposes with measurable success. In Berlin is constructed a small villa, the walls of which are built of glass bricks of several shades of dark green or blue. The glass bricks are especially adapted to construction where light, cleanliness, and neatness are particularly in demand. In Hamburg they are utilized in place of windows. They admit light in walls which police regulations require to be fireproof and windowless.

In addition to admitting light to dark hallways, rooms, etc., they are said to possess the same strength as ordinary clay bricks. They are also utilized in walls in yards and in partitions in the interior of houses, salesrooms, offices, workshops, etc., as well as for construction of verandas, hothouses, kiosks, bathrooms, hospitals, ice factories, butcher shops, railroad stations, breweries, stables, and in other places where cleanliness, light and uniform temperatures are especially desired.

The bricks are also made with a wire coating for fireproof walls. In some of the recently erected buildings in Milan, Italy, bricks made of glass have been adopted for ground and upper floors on account of the light obtained. They are also coming into use for partition work in some of the hospitals on account of hygenic principles.

In one of the leading banking institutions of the city of Turin the lobby office floor, which is about 36 by 58 feet, is entirely paved with glass bricks laid in iron frames for the purpose of admitting light into the basement where are located numerous private boxes or vaults. In the Netherlands hollow green transparent glass bricks are used principally for light giving purposes in machine shops and conservatories.—Exchange.

* * *

Life in a Flat

"Hello, Tom, old man, got your new flat fitted up yet?"

"Not quite," answered the friend. "Say, do you know where I can buy a folding toothbrush?"

Importance of Washed Sand and Gravel for Concrete Construction

By COLBY M. AVERY, C. E. *

WE are making such rapid strides in building and bridge construction, and general engineering work that it has brought out many new methods of preparing and testing the ingredients entering into its construction.

Now the leading architects, engineers and contractors are demanding pure, clean, washed materials, free from dust, loam clay and dirt, in their specifications. The reason for this cleaning is that where stones or gravel coated with dirt of any kind are used, the cement cannot reach the stone, but is allowed to set up against this film of foreign matter, which serves only as a form for the cement, and when set up it will have only the strength of the cement without its being thoroughly fastened or united with the sand and stone or gravel. Where washed sand and gravel is used the cement coats the clean surface of the material used in the concrete during the dry mixing, and then, when wet, the cement fills every void or cavity, both in the gravel used and the spaces between the sand and the gravel. A good illustration of this is cited in the history of a large contract for a concrete building erected in New Brunswick, in an extract from a paper read before the National Association of Cement Users at its convention, held in Milwaukee, in January, 1906, by E. S. Larned, C. E., of Boston, Mass.:

"It is gratifying to note the growing appreciation of the important part sand plays in all cement work; in very many instances poor results are directly chargeable to the sand used. No cement will improve properly if mixed with very fine sand and results will vary with the characteristics of the fine material. It must also be kept in mind that an intimate mixture of cement and fine sand is very difficult to attain, and a thorough distribution of cement throughout the sand voids is absolutely essential to good results. Sand that looks good is not always above suspicion. The following instance will serve to show the importance of testing the sand before use: An important hydraulic work was begun last spring in New Brunswick, and the contractors and engineers had congratulated themselves upon having what appeared to be an ideal deposit of sand and gravel for concrete work. The cement was thoroughly tested with standard sand, with good results. When everything was ready an active start was made and considerable concrete was placed before any doubts arose; it would not set up, however, in a week's time (or longer, as it proved), and the cement was immediately tested again, with favorable results, and then some of the sand was examined. On the washing test it was noticed that a slight opalescence was imparted to the water, remaining in suspension several days, but leaving practically no deposit or sedimentation. The cement was then tested with this sand before and after washing, and the trouble was at once located. The sand and gravel were both washed thereafter, and good results followed."

Also from a paper by Sanford E. Thompson, M. Am. Soc. C. E., Newton Highlands, Mass.:

"Comparative tests indicate that different stones for concrete in order of their value are as follows: (1) trap, (2) granite, (3) gravel, (4) marble, (5) limestone, (6) slag, (7) sandstone, (8) slate, (9) shale, (10) cinders.

*Rock Products.

The hardness of the stone grows in importance with the age of concrete. Thus gravel concrete, because of the rounded surface, at the age of one month may be weaker than a concrete which is made with comparatively soft broken stone, but at the age of one year it may surpass in strength the broken stone concrete, because, as the cement becomes hard there is greater tendency for the stones themselves to shear through and the hardness and smoothness of the gravel stones thus comes into play."

There are instances where concrete structures have failed by the using of dust-covered sand and gravel. In one instance a pier was built where a loamy sand was used, it being the only available sand, and after a week's test the concrete was like putty and would not set harder. This work had to be replaced with clean washed sand and washed gravel. Sand and gravel, when pumped or dredged from the bottoms of rivers and lakes, is not fit for use without first being washed by a process that will roll and tumble it in fresh, circulating water, as the particles are often coated with slime and dirt that will stay with it unless passed through a washer.

The best principal for a washing plant is one that will roll and tumble the sand and gravel in the presence of a rapid running stream of water, which will also size the gravel and allow the oversize pebbles to fall into a crusher which will redeliver its product to the first washing screen, thereby saving and washing all the product of the bank. The successive steps of screens will make any number of sizes, and the fine sand can be taken out of the coarse by the process, and also will be settled into receiving tanks, from which the clay and dirt has passed off in a solution with the water, leaving the sand to settle as noted above. This method allows the contractor to purchase material that is of exact sizes that have been specified by the architect or designing engineer, and he is enabled to get both coarse and fine sand to fill any specifications that may be demanded.

* * *

The White House Dining-Room

PROBABLY the most harmonious furniture in the White House is that in the dining-rooms, notably the antique mahogany table, sideboard, and serving tables in the private dining-room and the immense mahogany sideboard supported by eagles with outspread wings, in the state dining-room, which was designed by Mrs. Roosevelt and constructed expressly to her order. Although Mrs. Roosevelt's design was original, there has lately been found on an old Maryland estate an antique sideboard which is almost an exact counterpart of the White House piece, spread eagles and all, and which conclusively proves how closely Mrs. Roosevelt's design adheres to colonial tenets.

The old Flemish tapestries in the state dining-room, bearing inscriptions from Virgil, have, of course, prominent place among the art furnishings of the White House, and doubtless the category of the ornamental trophies in this apartment would be considered incomplete without reference to the mounted game heads which adorn the cornice. Over the big open fireplace is a moose head, flanked on either side by the head of a mountain sheep. In the center of the wall opposite is the immense moose head presented to Theodore Roosevelt.

The Interior Decorations of Mr. Rockefeller's New Home

THE interior of the residence of John D. Rockefeller at Pocantico Hills, N. Y., is simple, refined and elegant. It is essentially a home, and the beautiful decorations and furnishings were selected with the home idea foremost.

On the main floor, which opens onto the gardens of the south side, are the drawing-room, Mr. Rockefeller's office, the hall and music room combined, library and dining-room. All of these rooms have direct openings to the broad terraces that surround the house. Above are 10 masters' sleeping-rooms and 11 servants' rooms.

The interior has been furnished in eighteenth century English. The theme is carried throughout the house, but a pleasing variation in the several rooms has been obtained by the utilization of the products of the different styles. Chippendale has been used in one room, Hepplewhite in another, Sheraton in a third and the Adam in others.

All of the rooms are finished in white panel wood-work that has been fashioned in keeping with the furnishings.

The dining-room and living-room have been finished in Chippendale style. A rare feature of the furnishings of these rooms is found in the rugs, which are of solid colors, except for the borders. In the dining-room, the main pieces were fashioned after English designs, but the table especially shows the effect of the Chinese lattice ornament scheme that was adopted by Chippendale.

The homelike air for which the furnishers have striven at the wish of Mr. Rockefeller has been enhanced in the living-room by the introduction of many luxuriously upholstered pieces.

The white panelling that has been uesd in the other rooms of the house is not found in the office, which is finished in dark oak. As much attention has been paid to effecting a comfortable aspect here as in any other room in the house and there are few indications that it is a room devoted to business. The sombre furniture is upholstered in a bright red that neutralizes the sober appearance of the dark woods. A large rug of the same shade of red is laid and when the hearth fire is lighted the room is one of the cheeriest in the house.

Fine engravings of famous financiers form the chief decorations and are the indication that might lead any one to believe that here is where Mr. Rockefeller transacts his business when he is at the place.

The attention to detail and accuracy of reproductions are evidenced also in the bedrooms, which likewise embody the idea of repose. The Adam style is carried out in Mrs. Rockefeller's room. Mr. Rockefeller has chosen Chippendale for his room and the two styles are carried out in the guest rooms, some of which are also finished in Hepplewhite.

* * *

Stopped Him in Time

"It is time," said the speaker, "that we had a moral awakening in this town. Let us gird up our loins. Let us take off our coats. Let us bare our arms. Let us——"

"Hold on now," screamed an angular lady, who was seated near the platform; "if this is to be a moral awakening dont' you dare to propose to take off another thing."



Residence and Apartment Flats for Lillian A. and Catherine S. Marsh, San Francisco
Henry C. Smith, Successor to Stone & Smith, Architect

Municipal Engineering in Portland

PORTLAND is the oldest of the principal cities of the Pacific Northwest, writes W. P. Hardesty, C. E., in "Municipal Engineering." Its growth, until the past three or four years, has been comparitively slow for a western city. In its avoidance of everything but the substantial in its development, the city has generally been regarded as ultra conservative. Beginning in 1905, Portland took on new life, since which time so rapid has been its growth that the extension of the ordinary municipal utilities has hardly kept pace with the expansion and rapid building up in every direction.

Of the principal utilities required in every municipality, the lighting has always been supplied by a private corporation. The municipality has been more forward than most cities in providing an abundant supply of pure water. The water-works department is managed by a commission, called the Water Board, that employs its own engineer. The city has never had a board of public works. The execution of the ordinary public works is entrusted to the city engineer, appointed by the Mayor. The principal construction works carried out by the City Engineering department are the sewerage systems and street improvements. Prior to the adoption of its present charter on January 23, 1903, all street improvements and sewer works were in charge of a Superintendent of Streets. There was no City Engineer, but here was a City Surveyor whose work was practically limited to giving lines and grades.

In carrying on his work, the City Enginee· has several assistant engineers, designated by ordinance as "Civil Engineers." For improvement work the city is divided into several districts, each in charge of a district

engineer. Until recently, these district engineers had charge of only the survey work within their respective districts. Within the city engineering department was an inspection service, with several chief inspectors and a number of subordinates. To the inspectors was given the inspection of all contract work, the superintendence of what work was done directly by day labor, and maintenance and repair work. The chief inspectors reported directly to the city engineer, and they were not directed by the district engineers, contrary to the nearly universal custom. Under the practice very recently inaugurated, the head inspectors within the different districts are directed by the district engineers.

In contract work in Portland, as has always been required by the charter, no partial estimates can be made the contractor, but he must wait until his contract is entirely completed and accepted before receiving any pay. In a large contract taking a long time to complete, especially in high-class construction where final tests and disputes as to quality of work may delay acceptance, this puts a heavy burden on the contractor, and it results in prices for city work averaging 10 to 25 per cent. higher than for work where the usual method is followed.

The Mayor is assisted in his work by an Executive Board, appointed by himself. This Board awards contracts and accepts work, the appropriations for payment being made by the City Council. Working within the board are a number of committees, each dealing with a separate subdivision of the city's affairs. The City Engineer confers with this board regarding his work, having but little direct dealing with the City Council.

The present city charter has been found faulty in some respects. Some small matters that are more properly subjects for ordinance have been included within it. Proposed amendments to it can be voted on at the general municipal election, held every two years. At the election in June, 1909, a proposed new charter on the commission plan failed of adoption.

Under the present charter there is a Mayor, a single body of fifteen councilmen, an auditor, treasurer, attorney, and a municipal judge, all elective. The Mayor has power of appointment of other officers, without consent of the council.

The auditor's office is one of the most important in the city government. In it are included the duities of city clerk and recorder, offices commonly found in other city governments, and all assessments against property for public improvements are figured here instead of in the city engineer's department.

The direct assessment method of paying for public improvements in Portland is carried further than is usual. Grading, sidewalk and pavement improvement of street, sewer laterals, and for the past two years all water mains in size less than 10 inches, are assessed directly against the abutting property. Each lot is assessed its share for the half street width directly in front of it. This rule proved very inequitable in cases where, in grading, heavy cuts or fills fell in front of certain lots, as the yardage of material was segregated for each lot. To remedy this to some extent, it is now the practice to divide the cost of the grading in each block length proportionately to frontage. Street intersections are divided into four quarters, and each quarter is assessed against the adjoining quarter block, though it was formerly the custom to assess for only 100 feet down each side from the corner. On streets traversed by street railway lines the cost of grading and paving is greatly lessened to the property owner, as the street railway company pays for the portion included by its tracks and for one foot on each side.

The assessments become liens on the property. Where it is not desired to pay them at once they are "bonded," that is, the time for payment is made ten years, and payment can be made in ten equal annual installments bearing 6 per cent. interest.

Bridges are always paid for by general taxation. Districting is only done in the case of sewers, where the main sewer and principal branches are paid for by an equal assessment over the entire district. The district method is the logical one in the case of sewers, the outlines being fixed in general position by natural drainage boundaries.

* * *

The Clay-Working Industries

THE United States Geographical Survey has just published a large chart showing the statistics of the clay-working industries in 1908 by states and products, with comparative totals for 1907. This chart shows that the clay products of the United States in 1908 were valued at $133,197,762, compared with $158,942,369 in 1907, a decrease of about one-sixth. Every state and territory except Alaska is represented in this total, a fact which shows the widespread character of the clay-working industries. Ohio is the leading clay-working state, reporting products worth $26,622,490, or 19.99 per cent of the total. Pennsylvania, New Jersey, Illinois, New York, Indiana, Missouri, California, Iowa and West Virginia are the next largest producing states, in the order named. These ten states produced wares valued at $98,494,107, or nearly three-fourths of the value for the whole country. The first five states produced considerably over one-half of the total output. Wyoming has the smallest production, with products valued at $52,282, or only 0.04 per cent of the total.

Every state reported common brick, the total quantity being 7,811,046,000, valued at $44,765,614; this represents over one-third of the value of all clay products. Illinois is the leading producer of common brick, reporting 1,119,224,000, valued at $4,834,652, or $4.32 per thousand. New York is the second in quantity but first in value, the figures being 1,055,006,000, valued at $5,066,084, or $4.80 per thousand. The average value per thousand ranged from $3.97 in Kansas to $10.33 in Wyoming, with a general average of $5.73. Tennessee comes the nearest to the general average—$5.72. The average value in 1907 was $6 for the whole country.

There was a decrease in the value of the common brick from 1907 of $14,079,847, or 23.85 per cent, and the quantity decreased 1,984,652,000, or 20.26 per cent. The only states showing increases in output of common brick were Arizona, Idaho, Nevada, Montana, Oregon, South Dakota, and Washington, and of these states Washington showed a decrease in value.

Vitrified paving brick is one of the only two products that showed an increase in 1908. This product increased from 876,245,000 in 1907 to 978,122,000 in 1908, a gain of 11.63 per cent; and in value from $9,654,282 in 1907 to $10,657,475 in 1908, a gain of 10.39 per cent. Ohio is the leading state for vitrified paving brick, reporting about one-third of the entire quantity and value.

Drain tile is the other product that reported a gain in 1908, the increase being from $6,864,162 in 1907 to $8,661,476 in 1908, or 26.18 per cent. This product finds its largest use in the Middle West—Iowa, Indiana, Ohio, Illinois, and Michigan reporting 89.84 per cent of the total.



Mural Painting of Royal Bengal Tiger
Executed by Pfister & Co., San Francisco

Fire brick was reported in 1908 to the value of $10,696,216, compared with $14,946,045 in 1907, a decrease of 28.43 per cent. The quantity decreased from 783,017,000 in 1907 to 552,366,000 in 1908, a loss of 29.46 per cent.

Pottery products decreased in value from $30,143,474 in 1907 to $25,135,555, a loss of 16.61 per cent. The value of the pottery products was nearly one-fifth of the value of all clay products.

Copies of this chart may be had by addressing the director, United States Geological Survey, Washington, D. C.

* * *

Peasant (who as just insured his farmhouse)—What would I get if my house should burn down next week? Agent—In all probability, three or four years in prison.—Fliegende Bladder.



Mural Painting of California Grizzly Bear, seven by seventeen feet
Liebes & Co.'s Store, San Francisco
Executed by Pfister & Co.

Among the Architects

American Institute of Architects

(ORGANIZED 1857)

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Glenn Brown (ex-officio).....Washington, D. C.
Walter Cook..........................New York
S. B. R. Trowbridge..................New York
J. L. Mauran.....................St. Louis, Mo.

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Washington State Chapter, A. I. A.

OFFICERS FOR 1909

President...........................C. H. Bebb
Secretary...................Arthur J. Russell
Treasurer..........................J. F. Everett

Dissolve Partnership.

One of the best known architectural firms in San Francisco has dissolved partnership and in the future the two members will practice independently. The firm of Meyers and Ward, Kohl building, terminated the first of the month, Mr. Henry Meyers retaining the old offices in the Kohl building and Mr. Clarence R. Ward forming a partnership with J. H. Blohme with offices in the Alaska Commercial building. Mr. Blohme was for a number of years associated with Meyers and Ward as draughtsman. Since the fire the firm has been prominent in the rebuilding of San Francisco, some of the more important buildings designed by them being the Alaska Commercial, the Wells-Fargo, Samuel's Lace House, Goldberg, Bowen and the Hobart estate.

Competitions and a Bad Law.

The city of Alameda recently called for competitive plans for a $60,000 school house. Some eight or ten reputable California architects participated in the competition. A number who were invited declined because of certain conditions which the Board of Education of Alameda specified should be followed. It seems the district attorney of Alameda county unearthed an old law, passed in 1872, which stipulates that each competing architect shall give a "good and sufficient bond with two sufficient sureties thereto, or a surety company, in the penal sum of $5,000, same to be given prior to the awarding of any premium for plans and specifications."

In other words, the architect is put in the same class as the contractor. When the latter figures on a job he is expected to file a surety bond amounting to a certain per cent of the contract price. That is all right for a contractor, but it's ridiculous to demand such a bond of an architect. It is obvious that the law was intended to protect the builder in days when the architect not only made the drawings but put up the building. In these days of enlightenment and professional etiquette the registered architect draws the line when it comes to contracting. He may superintend a job but he never contracts to build. If he does he violates the principles of the American Institute and lays himself liable to prosecution.

It has not been given out how many of the competing architects for the Alameda school filed a $5,000 bond. If any of them did they deserve to be censured. On the other hand, if they did not, the district attorney could legally throw out their plans and call for new ones. Reports from Alameda are to the effect that the school board was unable to agree upon the best set of plans submitted and as a result all the drawings were rejected and new designs are to be called for. It remains to be seen how many architects will care to compete if the surety clause is again to be injected.

San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter, American Institute of Architects was held in the green room of the Hotel St. Francis on the evening of September 16th.

The principal business transacted was the adoption of the report of the committee on the code of ethics for the professional conduct of members; the appointment of a committee to entertain the visiting officers and members of the American Institute during the Portola festival; the report of the committee on tenement house ordinance and the election of Mr. Walter H. Parker to chapter membership.

Personal.

George C. Sellon and E. C. Hemmings, formerly associated under the firm name of Sellon & Hemmings, have dissolved partnership. They will both continue in business in Sacramento. Mr. Sellon's address will be—fifth floor, 1005 "K" street. Mr. Hemmings'—Suite 37, 1005 "K" street. The San Francisco office has been discontinued.

Architect William Curlett recently enjoyed a trip East, visiting many of the leading cities. During his absence his son was in charge of the office. The work of Mr. Curlett and son will be shown in detail in one of the future numbers of the Architect and Engineer.

Architect E. Russell Ray, formerly with Hunt & Grey of Los Angeles, but lately of the firm of Higginson & Ray of Santa Barbara, has purchased the interest of Mr. A. B. Higginson in the firm and will maintain architectural offices in his own name in the H. Canfield building, Santa Barbara.

Architect F. L. Roehrig of Los Angeles spent his vacation in San Francisco, Portland and Seattle.

Architect B. Cooper Corbett of Los Angeles went to Lake Tahoe for his summer outing.

Charles W. Hoffman is the new manager of the Pacific Portland Cement Company in Los Angeles, succeeding J. G. Treanor, resigned. Mr. Treanor has been appointed general sales agent of the Southern California Cement Company, whose plant is at Riverside.

George T. Plowman, recently of Berkeley, has removed to Los Angeles, where he has opened offices at 312 Wright and Callender building, with Mr. Paul A. Needham.

Parkinson & Bergstrom Busy.

Architects Parkinson and Bergstrom, Security building, Los Angeles, have recently closed a number of important contracts in connection with the building of the new Utah hotel at Salt Lake City and also the Kearns building in the same city. James Black & Company of St. Louis are the general contractors for the hotel, their contract being for $855,000. Thomas Haverty & Company, a Los Angelos firm, will do the plumbing and steam heating for $100,000, and the same house will do the plumbing in the Kearns building on its bid of $42,000. B. V. Collins, another Los Angeles concern, will do the marble and tiling for $41,000. The contracts on the Utah hotel so far closed amount to $1,186,000 and those on the Kearns building, $620,000.

Architect Schnaittacher Moves.

Architect Sylvain Schnaittacher, who is secretary of San Francisco Chapter, American Institute of Architects, announces his removal from the Investors building at Fourth and Market streets to 902-904 First National bank building, Montgomery and Post streets, San Francisco. Mr. Schnaittacher's telephone number is Kearny 744.

San Francisco's New Cathedral.

The plans of Bodley & Hare, architects of London, Eng., for the Episcopal cathedral to be erected on Nob Hill, San Francisco, are to be modified by Architect Louis P. Hobart, of San Francisco, to meet local conditions in some respects, but they will be used in most regards as they have been prepared.

The length of the cathedral will be 275 feet. The height will be 152 feet.

Standing on the splendid height donated for the site, the cathedral structure will be one of the most conspicuous of the buildings of San Francisco.

The greatest width of the cathedral will be 200 feet. The framework will be of steel. Inside and out the finish will be stone.

The general effect of the structure will be that of an old English cathedral with a main central octagonal tower. When it is completed the cathedral will give seating accommodations to 2,000.

Architectural Club Meets.

The Los Angeles Architectural Club held its first meeting in the new club rooms on the Fourteenth floor of the Union Trust building, early in September. The club now has well-lighted and airy quarters, where it is expected the members will pass many instructive and socially enjoyable hours. The rooms are to be open at all times for the benefit of the members.

A competition is to be held for the cover design for the year book. Mr. A. F. Rosenheim, president of the club, has personally offered a prize of $25 for the best design.

Various features of the club work for the coming year received discussion at the meeting, among them the architectural exhibition, which is to be held about the first of the year. This exhibition promises to be not only the best ever held in Los Angeles, but a particularly meritorious one from the fact that drawings of the best recent work of Eastern architects will be included in the exhibits. These drawings will be brought from the exhibition in San Francisco under the auspices of the Architectural League of the Pacific Coast, to which a number of local architects have sent examples of their work.

The club now numbers seventy-six members and promises to develop into a prosperous and enthusiastic organization.

Chance for American Architects.

Americans are expected to enter a competition open to the architects of the world by the Argentine republic to obtain plans for the proposed polyclinic "Jose de San Martin," which will comprise twenty splendid buildings in Buenos Aires. The author of the best project will be instructed to execute the definite plans and will take charge of the technical direction of all the work. Architects winning second and third places will receive prizes of $10,000 and $5,000 respectively. The government of Argentina is said to be especially desirous that American architects participate in the competition because of the excellent relations that exist between the two countries.

The preliminary announcement of the advisory committee of the above important competition has been issued. Its various provisions, briefly summarized, are as follows:

The competition will open on June 10, 1910, and continue until 12 o'clock noon on December 10, 1910.

The committee's decision is to be announced within thirty days after the closing of the competition.

Competitors shall in every case submit the following:

General plan—scale of 0.005 per meter.

Partial plans of each floor of each building.

Longitudinal and cross-sections of each building, scale 0.01 meters.

Elevations (front) of main buildings and pavilions, scale 0.01 per meter.

Bird's-eye view to be one meter long at greatest length.

Detached description and general estimate.

A financial bid. This bid not to be compulsory and may be limited to mere presentation of other documents.

The author of premeated design to be entrusted with preparation of final plans and to have tectural supervision of work. Second best plan to receive an award of $10,000 and next best $5,000.

The executive committee to have the power to declare void the competitive contest if in the opinion of its advisors the plans submitted are not worthy of the award.

Prize winning plans to remain the property of the Government and may be disposed of as deemed advisable. The author of plan selected to receive as full fee 5 per cent of price of building proper, excluding every annex or structure in which the author has no participation.

Further particulars may be obtained by application to Consul General, Argentine Republic, 80 Wall Street, New York.

Architects for Honolulu Federal Building

Announcement is made by Supervising Architect John Knox Taylor that the plans of Architects York and Sawyer, of 156 Fifth avenue, New York City, have been selected by the Commission of Award in the competition for a Federal building, recently conducted by the United States government, under the direction of Supervising Architect Taylor. The scheme is to include a custom house, court house, postoffice, etc., and the appropriation available is $800,000. Dickey & Reed and John Galen Howard are the Pacific Coast architects who were honored by invitations to compete. The other architects who offered schemes were Palmer & Hornbostel, F. B. Huntington and Hoppin & Koehn, associates, and Butler & Rodman, all of New York; Mauran & Russell of St. Louis, Hornblower, Marshall & Wood, Donn & Deming of Washington, D. C.; D. H. Burnham & Co., Holabird & Roche, Richard E. Schmidt, Garden & Martin, associates, of Chicago; Parker, Thomas & Rice of Baltimore, Md.; Potter & Merrill of Tacoma, Wash., and C. C. Zantzinger of Philadelphia, Pa.

The Commission of Award was composed of James G. Rogers of New York, Glenn Brown and Nathan C. Wyeth of Washington, W. G. Nolting of Baltimore and Mr. Taylor, the supervising architect.

The Tenement House Laws of San Francisco.

New building laws, compiled by a committee of builders, insurance men and architects and others to take the place of the building laws now in existence, have been filed with the clerk of the San Francisco Board of Supervisors.

The old tenement house laws were adopted after an energetic campaign on the part of interested men and women who wanted to safeguard the health of the poor who are compelled to take such apartments as their limited earnings provide, regardless of sanitary conditions. The elimination of city tenement house laws, according to the opinion of City Attorney Percy V. Long, would make the enforcement of similar State laws an uncertainty. The city charter makes the Board of Public Works responsible for the enforcement of city building laws, but whether the board would be required to guard against the violation of the State tenement house law is something that the courts would be compelled to determine. Long says:

"The building committee of the Board of Supervisors has been verbally advised," said Long yesterday, "that the State law should be re-enacted by the city to insure proper enforcement, and I will suggest to the Board of Supervisors that the State tenement house law be made a part of the new building ordinance. The advisory committee, which prepared the new ordinance filed it without first getting the approval of my office."

Since the first enactment of the city tenement house law, there has been strong opposition to the measure on the part of many property owners. The requirement of a yard twelve feet wide in the rear of a tenement house was considered as a hardship. This provision was placed in the law to afford light and air for tenements.

For almost a year the special committee has been at work on the new building laws. The purpose of the new ordinance is to simplify and to make more comprehensive the legislation on this complex subject.

Among the more important features of the new ordinance is new limitations for class C and frame buildings. The present laws allow class C buildings to be constructed eighty-four feet in height, and it is proposed to change this to seventy-five feet. Frame buildings, which have no classification, are to be limited to forty feet in height, instead of forty-five feet, as at present.

Some changes in classification have also been suggested. One is to transfer fireproof buildings with brick bearing walls from class B to class A, to which it is said they have a closer relation.

If the proposed ordinance is adopted, provisions for the construction of reinforced concrete buildings will be modified to the extent of requiring a less proportion of steel than at present.

Special stress is placed on the quality of materials by the proposed new law. It will differ from the present ordinance by making the quality govern the quantity required.

The special or advisory committee, selected by the building committee of the Board of Supervisors to prepare the new building laws, consists of the following:

William F. Wilson, member of the Board of Health, chairman; P. H. Shaughnessy, Chief of the Fire Department; F. H. Porter, chief inspector of the Underwriters' Inspection Bureau; J. P. Horgan, chief inspector of the Board of Public Works; J. D. Galloway, civil engineer; R. H. Mathewson, builder; Nathaniel Blaisdell, architect. Morris Bruce, architect, served as secretary.

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A LAW THAT SHOULD BE REPEALED

Our attention has been called to an old California law which has been on the statutes since 1872 and which has recently been uncovered by an enterprising District Attorney who declares it shall be inforced. The Act in question has to do with competitions and requires the competing architect to give a bond with the filing of his plans and prior to the awarding of any premium for said plans. In other words, the architect is placed in the same category as the contractor. To say the law is ridiculous is putting it mildly. It's nothing short of a joke, yet it's a law nevertheless and if some ambitious District Attorney wants to inforce it there is nothing to stop him. Back in 1872 when the Act was passed architects were not only designers but they frequently built the buildings which they designed. With the appointment of a State Board of Architecture some years later the scope of the profession became more definitely defined and today the architect who enters the contracting business not only violates the ethics of his profession but he makes himself liable to prosecution. The very foundations of the American Institute of Architects are based upon this important question and it would seem to be the duty of those in authority to see that the Act is stricken from the Statutes at the earliest possible moment.

BRICK AND THE U. S. GEOLOGICAL SURVEY

Brick always has and always will be an important factor in the building material business. The recent statistics published by the United States Geological Survey contain one promising feature. Face brick and the commons of good grades have increased both in volume and in value, while the low grade commons have decreased both in number and in value by even a greater ratio. These low grade common brick have gone from bad to worse in the last few years until now they really contain no structural values either for compression, tensile strength, fire resistance or density. They are unsightly, and when the tremendous cost of putting them into a wall in most of the markets of this country is taken into consideration, they are at the same time about the most expensive material that could be selected. We congratulate the discriminating building public on the facts exhibited in the Survey's very complete report.

THE DOLLAR SIGN IN ARCHITECTURE

And now the daily and weekly press have taken to publishing floor plans and discriptive articles on "How to Build a $5,000 House for $2,500." For a time the monthlies seemed to have a monopoly of this field. Most of these "Economy in Home Building" contributions come from novices who have had little or no practical experience either in architecture or actual construction work. What they write and the drawings they show seem attractive enough on paper but when worked out in reality the results are as heart rending as they are purse-breaking. The Architectural Review is much disturbed that so reputable a publication as Collier's Weekly should print such stuff and echoes the sentiments of the architectural profession in the following caustic comments:

We regretfully note that the standard of the dollar-sign in architecture has again been adopted, and this time by so important a publication as Colliers' Weekly. For years, throughout the country, the architectural profession, the building-trades and the intending home-builder have suffered from widely published misrepresentations as to the costs of house-building, for which the popular magazines—and especially The Ladies' Home Journal—have been solely responsible. Year after year this journal persists in publishing house designs that cost two and three times the sums they claim. No person with knowledge of the situation but would instantly agree that The Ladies' Home Journal has done more to permanently injure the development of domestic architecture in America than any other single influence that has been exerted upon its progress.

It was with considerable trepidation that we read the announcement of Collier's intention to take up, in the section of their magazine entitled "Outdoor America," the subject of "Home Building and Furnishing;" especially when it appeared that this department was not under the control of a person of any knowledge whatsoever in this important and specialized field, but merely of a "Sporting Editor!" It hardly seems dignified or just for a magazine of this reputed standard to treat a profession of the importance of architecture so slightingly; but we confess to much greater disappointment at finding, as the first sample of their intentions, an article—entitled "The Economical Cottage; What We Can Do with $2,500" (sic!)—purporting to deal with homes for people who cannot afford servants and do their household work themselves, containing poetic references to silver candlesticks and tea-services, as well as such strength-producing viands as "Finnan-Haddie a la Newburg!" This is out-Boking Mister Bok with a vengeance!

Certified Architects.

The following have been granted certificates by the Southern California state board of architecture and have received their license to practice:

H. L. Ferguson, 1807 Church street, Los Angeles.

Luke Houghton, 704 Wright & Callender building, Los Angeles.

Montrose Warn, 3128 Winter street, Los Angeles.

Julian T. Zeller, 123 W. 31st street, Los Angeles.

D. W. Harris, 541 17th street, San Diego.

C. Ben Sholes, Long Beach.

Code of Ethics.

A new code of ethics was passed by San Francisco Chapter, American Institute of Architects, at its last meeting. One of the most important articles in the new code is that making it unprofessional and punishable by expulsion from the chapter for an architect in good standing to seek or accept clientage where plans have already been prepared by a fellow member.

Court House Competition.

One of the most important architectural competitions held on the Pacific Coast for some time will be that conducted by the Supervisors of Kern County for a $400,000 court house to be built at Bakersfield. The money is already available, through a special bond election. Particulars of the competition will be made public shortly.

HEATING AND LIGHTING

Material Arranged by Carl E. Roesch, Edwin B. Pike and Wm. E. Leland, S. B.

The Quality of Plumbing.

ECONOMY, as applied to the work of the plumber, cannot be regarded as synonymous with cheapness of cost. Cheap plumbing is always expensive in the end, making necessary continual and expensive repairs, which would have been avoided had the work been done properly and with proper materials at first. Practical, go-ahead plumbers, who are holding their own in the business, are not liable to adopt new systems unless their merits have been established by actual tests. The same articles that have been used for years are still being employed, in many cases, although they are looked upon as "old-fashioned," because they are designed in proper proportions in every respect, and not only operate in a satisfactory manner, but have their parts so arranged that they are capable of giving first-class service, even after they have been used, and "abused," for several years. Some of these old supplies really cost more money than newer ones which have been invented to supplant them, but, in the end, they are the more economical of the two.

One of the methods employed by manufacturers of the new designs of plumbing supplies, to cheapen their products, has been to make brass goods of excellent design, but which are so scant in real brass that they cannot be regarded as constructions of real merit. The saving of the brass cheapens the product, and makes it attractive to the owner or builder who rates economy only by shillings and pence, but the use of such makeshift supplies always results in eventual loss in shillings and pence. The designs are not strong enough to sustain the strain to which they are subjected, and the result is that they are constantly getting out of order and necessitating a call on the plumber for repairs, which involves the payment of more money.

Heavier brass goods than some which are used efficiently are often properly rejected by the conscientious plumber because they are faulty in design and proportion. There are water-closet combinations on the market which are so faulty in their action that the poor plumber who is so unfortunate as to be attracted by their cheap price, will have lots of trouble before he can induce his customers to cease their complaints, if he does not have to substitute some really fine goods when he has a customer who understands how a water-closet should operate. Owners who have not learned the difference between good enamelware and seconds and thirds, are very much at a disadvantage when they have to figure against a plumber who intends using one of the competition tubs, especially when the competition tub does not bear the stamp of the quality upon it.

Owners and builders should always choose the very best in their purchases of plumbing supplies. The plumbing is in reality the most important part in the construction of a home. If this is faulty, it makes no difference how elegant the design of the building, or how elaborately it is decorated to attract the eye, the structure is a failure, and constant worry and annoyance is waiting for the occupant.—Building.

Easy Rule for Furnace Men.

A simple rule for determining the equivalent cubic feet is: To the cubic feet in each room add for wall and glass exposure as follows (one-tenth of each square foot of wall exposure being equal in cooling effect to 75 cubic feet, and one square foot of glass exposure being equal in cooling effect to 75 cubic feet):

First, obtain the cubic feet by multiplying the length by the width of the room and by multiplying this result by the clear height of the ceiling.

Then multiply 10 per cent of the net wall exposure by 75 and add this amount to the total.

Then multiply the glass exposure by 75 and add this amount to the total cubic feet, and the cubic feet, the multiplied 10 per cent of the net wall exposure, and the multiplied glass exposure will constitute what may be called equivalent cubic feet; that is to say, the total will be equal to the cubic feet to be considered in determining the size of the furnace, the size of the warm air pipes and the size of the registers that will be required to heat the house.

Are Conditions in the Plumbing Trade Not Better Than Twenty-Five Years Ago?

A master plumber writes the following letter to Domestic Engineering, which should prove food for serious thought:

"The National Association of Master Plumbers recently held its twenty-seventh annual convention. It has been in existence for over a quarter of a century. At these conventions were gathered the brightest minds in the plumbing business. Many excellent resolutions were passed at different times. I have watched the work of these conventions for many years, but have we been successful in securing the position in the business world that our business justifies? I do not believe that a single member of the National Association of Master Plumbers will take the position that we have improved the conditions in the plumbing business. The improvement has been in the methods of construction, the materials and fixtures used. Laws have been enacted in many places to compel the plumber to install the work in a sanitary manner. Trade rules have been observed in many places restricting the sale of plumbing material to the legitimate trade. Examination of both journeymen and master plumbers are required in many locations.

"I know of no trade or profession that has had a greater amount of 'protection.' I also know of no business that has suffered so much from destructive competition. Now if my statement is true, and I have yet to meet the man that will contradict it, what is the cause? Have we not made a mistake in permitting the apprenticeship question to remain in the hands of the journeymen? I find no fault with the journeymen for any errors that they have made on the question; they were doing the best that their judgment and conditions would permit. They were not expected to see further than their own interests. The unrestricted use of apprentices did much to increase the number of workmen. Being unable to secure steady employment at fair wages they engaged in the business as master plumbers.

"Many men who were so incompetent at the trade (as workmen) that they could not secure sufficient employment to make a good living, were received with open arms into membership of Master Plumbers local associations. In this way they were foisted on the public as competent to serve it, and as an equal to compete with the best trained and experienced. This is only one phase of the question of why we have not improved our business conditions during the past quarter century.

"Is it too late to correct some of our errors of the past?"

Electrical Engineer Banqueted.

Ralph W. Pope, national secretary of the American Institute of Electrical Engineers, was the guest of honor at a dinner given recently by the San Francisco branch of that organization.

C. F. Scott, past national president of the same organization, was also a guest at the dinner. He is from Pittsburg.

Among the other guests were: A. H. Babcock of San Francisco, consulting engineer for the Harriman lines, and W. W. Briggs of Pittsburg. G. R. Murphy was chairman of the dinner.

Control and Regulation of Heat.

"THE first thing to be done in our homes, to bring about a better condition, no matter how they are heated," says Building Management, "is to stop overheating our living rooms and our bedrooms." A thermometer is almost as essential as the heating apparatus itself. With furnace, hot water, or steam heat, a thermostat should be used, and under ordinary conditions the temperature in the living rooms should never be above 72 degrees Fahrenheit. If proper precautions regarding humidity are taken, a temperature from 65 to 68 degrees will be found perfectly comfortable, and effect a considerable saving in the coal bill.

The regulation of the humidity is especially important. It is humidity and not real heat which is responsible for so much of the discomfort produced in the warm months of the year. A hot air furnace should always be equipped with an automatic humidifier of the right size. If it has this equipment the proper degree of humidity can be assured in the home. If no humidfier is applied to the furnace the water pan should be kept full of water, and a small can, or bucket of water should be hung under each register. If the home is heated by either steam or hot water, the indirects should be equipped with a perforated pan humid-giver, which is not expensive, and is so made that, while it will furnish a large volume of moisture in the air, it will not interfere with the heat.

The most important of all the requirements for controlling and regulating the heat is the ventilation. All ventilation must begin with the removing of foul air. Homes with fireplaces have a first-class exhaust vent, if properly used. If the fireplace is built solely for ornament the top of the flue should be capped with non-down draft, vent head. In homes heated by stoves or hot air, a light fire of shavings or paper, built in the fireplace will start the draft upward, and the exhaust vent will be completed. Much better results can be obtained where the fireplace can be used, as a light coal fire, or the heat from a gas log creates a strong updraft. In homes heated by steam or hot water a positive updraft can be maintained in the fireplace by running an aspirating pipe up the flue.

One bedroom, at least, should have an exhaust vent for cases of sickness. The living rooms in homes built without vent flues and heated by stoves, will have to depend upon window ventilation and the fireplace for fresh air and ventilation. When possible the window vents should be placed so as to get cross circulation, by putting a small vent in two windows, placed opposite each other, or at an angle to each other in each room. If this is not possible, there should be two vents of a larger size placed in two windows as far apart as possible. This method of ventilation is more expensive in fuel than that by aspirating vent flues, but it is worth the price in the health and comfort which it provides in the long run.

Sewage Disposal and Treatment by Electricity.

By Harry E. Mayhew, of Pasadena, Cal.

Considerable activity has been noted recently in relation to sewage disposal throughout the West. California, it would seem, is trying to set the pace along the line of installations, treatment, disposal and purification of its sewerage systems. Many of the smaller cities among which may be mentioned Bakersfield, Monrovia, Redondo, Coalinga, Santa Monica, Covina and numerous others are either installing a system or are contemplating such improvement. At Modesto, California, the firm of Sears and Baker have under construction a "Sanitary Self-Cleaning Cesspool," which is being built after the plan of one installed at Grinnell, Iowa, over five years ago, and which is handling the entire sewage of the city with eminent satisfaction. Mr. H. P. Simmon, an architect of Grinnell, is the designer of this new cesspool.

Perhaps the most interesting development along the line of "Sewage Purification" is noted at Santa Monica, California. Here the "California Water Purification and Sanitation Company," of Los Angeles, have erected a plant for the purification of the city sewage by the "Magneto Electrolytic Process." The plant cost $10,000 and has a capacity of treating 1,000 gallons per minute. After a test of this plant, covering a period of sixty days, which was made recently, it was found to give excellent results.

The question of sewage treatment is one that has for a long time occupied the attention of scientists throughout the world, and is at present a long way from being solved. No two places would seem to have the same condition, therefore every city must work out its own salvation.

The conditions in Santa Monica may for many reasons be considered as favorable, the absence of trade wastes making the conditions less complex than in most cities.

When Wright Is Wrong.

A man who had to leave on a journey before the end of a case begun against him by a neighbor, gave orders to his lawyer to let him know the result by telegraph. After several days he got the following telegram:

"Right has triumphed."

He at once telegraphed back:

"Appeal immediately."

The Portola Illuminations.

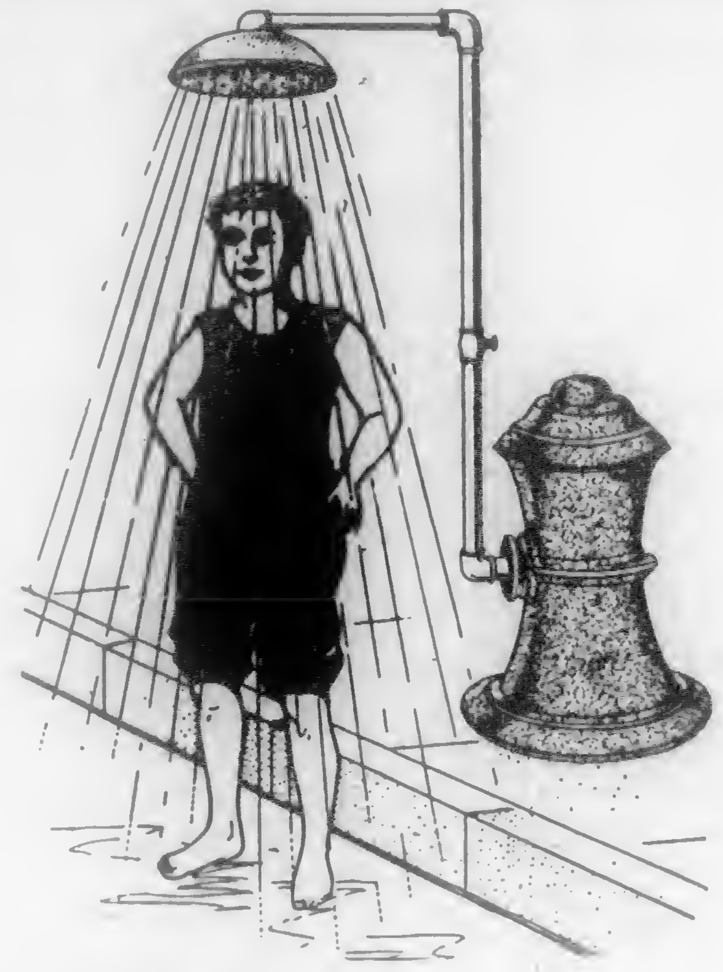
ONE of the crowning features of the Portola celebration to be held in San Francisco this month, will be the electrical illumination of the city. All previous attempts are destined to be eclipsed if the present plans of the committee do not miscarry. A contract has been given to the Central Electric Company of 185 Stevenson street and the high standing of this concern should insure the successful execution of the plans of the committee which are of a most pretentious order. For several weeks General Manager L. R. Boynton has been subletting contracts and directing the work of half a hundred experienced electricians who are going to literally turn night into day with the thousands of incandescent bulbs that will sparkle and flicker from the Mission to the Ferry and from North Point to the Third and Townsend street depot.

Approximately 100,000 horsepower and 3,000,000 candle power will be consumed in lighting the streets. The undoubted genius of San Franciscans for brilliancy of illumination will be seen throughout the city—nothing so magnificent ever has been attempted by a Pacific Coast city, if, indeed, by any city in the United States. At the intersection of Market, Third and Kearny streets there will be suspended an immense bell which will be lit up at night and will throw out a gleam of light that can be seen for forty miles. This will be the largest bit of single electric display ever attempted. In addition to the bell at Third and Market streets, there will be a court in colors calling for 1280 sixteen candle-power lamps. The Ferry colonnade will have 860 sixteen candle-power lamps comprising twenty loops of 43 lamps each. Along Market street from the ferry to Van Ness avenue will be suspended a veritable canopy of lights, there being 380 strings carrying a total of 15,580 globes.

On Market street from Van Ness to Valencia street there will be 38 strings, placed 40 feet apart and carrying a total of 1,558 lights. Similar canopies of light will prevail along Third street from Market to Townsend and on Valencia street as far as Sixteenth street. All this work will be done under the direction of the Central Electric Company at a total contract price of something like $30,000.

Besides the Portola work the Central Electric is busy wiring the following prominent buildings: Addison Head building at Post and Kearny streets, San Francisco, designed by Architect William Curlett; Mission Savings bank, Valencia and Sixteenth streets, Krim and Scott, architects; Knights of the Red Branch building, Shea and Lofquist, architects, and the Sacramento city hall. The following important work has been completed: Balfour-Guthrie building on California street, Abrams building, Market, between Sixth and Seventh streets; Callahan building, Market and McAllister; I. Magnin, Security, Davis and Shonwasser buildings.

Manager Boynton's company also had charge of the New Year's Eve decorations in San Francisco in 1908-09 and the fleet decorations in 1908.



Street Shower Bath in Operation

A Portable Street Shower Bath.

A unique shower bath originated by E. T. Brigham, superintendent at the Helping Hand Institute at Kansas City, Mo. is shown in the accompanying illustration. To make use of this shower bath in the street take one urchin sufficiently in need of an application of water, and a two-inch pipe from five to six feet long with an attachment at the end somewhat resembling an old-fashioned water sprinkler. Connect the apparatus to the street hydrant, place the urchin under the sprinkler and open wide the valve. By strict application to business an energetic man can sufficiently wet down about two blocks of urchins per day at a minimum cost to the taxpayers. Instead of having one sprinkler only, several can be "hooked up" to the two-inch pipe connected to the hydrant and the business conducted upon a wholesale plan. The riser can be made a trifle long, bringing the sprinkler high enough so that horses can be easily cared for with this apparatus. This idea appears to have merit. The entire apparatus is said to cost but six dollars and in congested districts where it is impossible for hundreds of people to obtain a bath, the idea would seem to be of practical value.

Mr. Pike's New Work.

Mr. Edwin B. Pike and Mr. Arthur B. Lebenbaum beg to announce that they have sold out their interests in the Butte Engineering & Electric Company and have established themselves in the Wiley B. Allen building as electrical manufacturers' representatives.

Messrs. Pike and Lebenbaum are well acquainted in the electrical field and in the future will conduct a manufacturers' agency business, that will not only be a credit to the houses they represent, but also to themselves.

Fixtures, lamps, heating appliances, electrical novelties, and fixture glassware, from the leading shops of America will be carried by Pike & Lebenbaum.

By the Way

Some Industrial Information Worth the While

The Success of One Hardwood Concern.

Way back in 1863 Mr. J. H. Dieckmann began shipping hardwood logs from the West Coast of Mexico to all principal markets of the world. In 1884 he came to California and established headquarters in San Francisco, from which point he could better inform himself about market conditions and at the same time ship all kinds of merchandise in payment of his tropical products. Besides the following hardwoods, primavera, mahogany, Spanish cedar, rosewood, lignum vitae, tampinziran, etc., he brought into this market coffee, hides, etc.

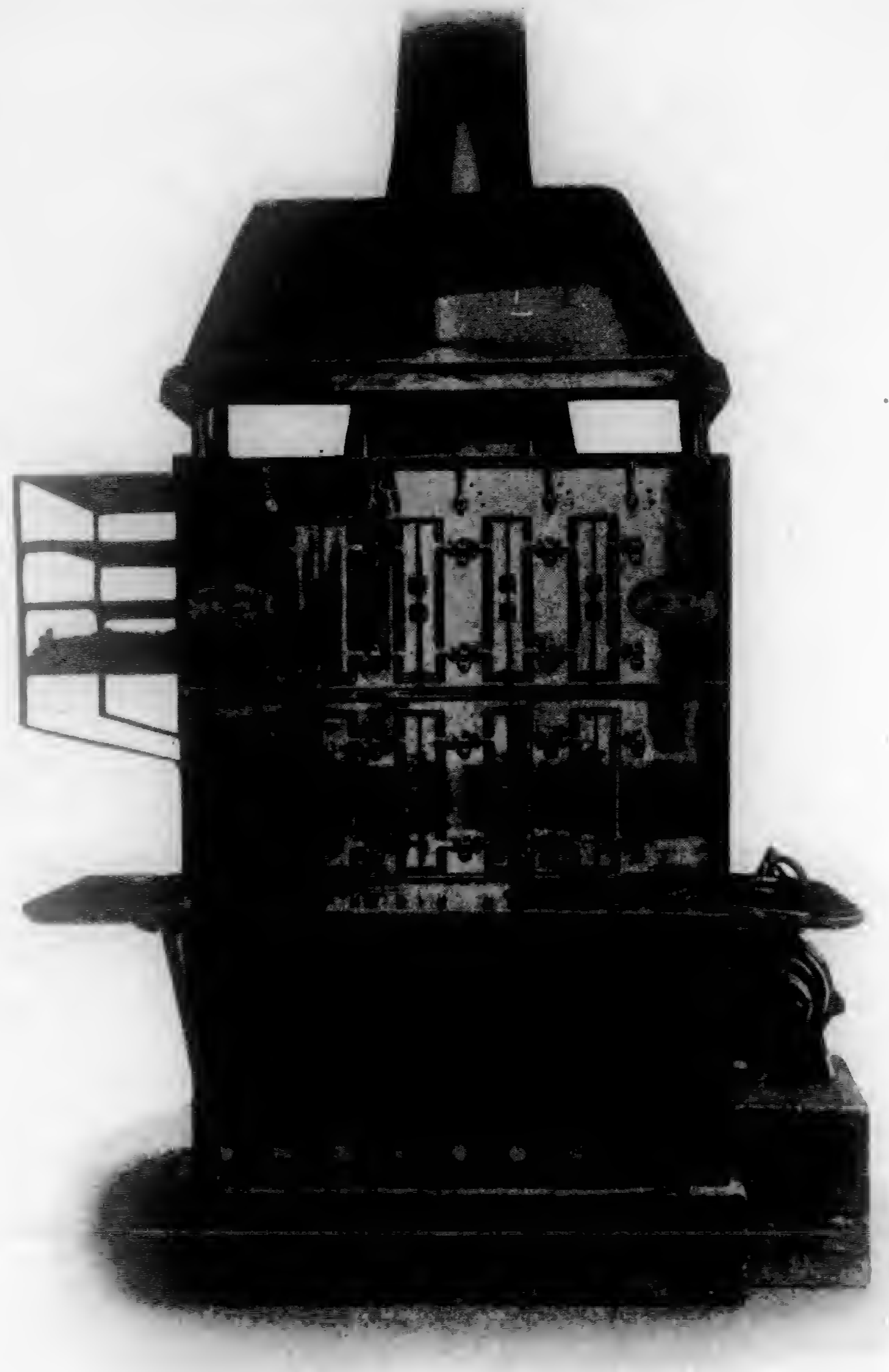
In 1904, with his four sons, he incorporated the Dieckmann Hardwood Company, for the purpose of manufacturing and marketing at wholesale and retail lumber and veneers. From the first turn of the wheels of their sawmill, the new firm has gone steadily ahead until today the company ranks among the leading Pacific Coast hardwood lumber dealers, and in a class by itself as hardwood lumber and veneer producers.

When one of the firm was asked about the secret of its success, he modestly attributed it to the fact that its lumber was manufactured in San Francisco, and people naturally preferred to patronize home industries, instead of using material produced elsewhere. Mention was also made of the fact that we are living in an age of "specializing"; that is, a firm can no longer effectively and successfully deal in many kinds of woods, but must make a specialty of a few if it expects to supply its trade with the best at minimum prices.

Of Interest to Contractors.

A friendly suit to determine whether contractors holding contracts for public works can legally compel their employes to work more than eight hours a day is contemplated by City Attorney Swing of San Bernardino. In some recent contracts awarded under the Vrooman act, to which the city was a part, stipulations were made that only American citizens be employed, that eight hours constitute a day's work, and that $2 be the minimum daily wage. Under these provisions contractors were compelled to dismiss Mexican laborers.

The Johnson-Shea Company will probably take the initiative in the suit to test the eight-hour provision. This company has the contract for paving Fifth street, and the manager will present to the Street Superintendent a contract with the eight-hour stipulation stricken out. This the Street Superintendent will refuse to sign under instructions from the City Attorney, and the Johnson-Shea Company will take the matter into court on a mandamus proceeding.



OIL BURNING CABINET BROILER AND RANGE

The S. T. Johnson Company of 1334 Mission street, San Francisco, recently installed an oil burning cabinet broiler and range in the restaurant of the Golden Pheasant at 32-36 Geary street and range in the restaurant of the their purchase that a month after the installation they wrote Mr. Johnson's company as follows:

Cabinet Broiler & Range Co.,
1334 Mission street,
San Francisco.

Gentlemen: After giving your cabinet broiler a thorough practical test in our kitchen, we are glad to inform you that we are more than satisfied with it. Upon installing your cabinet broiler we removed our charcoal broiler entirely, such was the confidence we had in the "Cabinet" from witnessing the experimental tests. We have never had occasion to regret the removal of the old broiler as the new one has worked without a hitch.

Since we have been using the "Cabinet" many of our patrons have complimented our broiled meats; and we ourselves know that the steaks and chops which we are now serving are of better flavor and contain more juice than those served from an old fashioned broiler. In the matter of time we find that orders are turned out twice as fast now as formerly.

While we have not had time to test the fuel consumption we believe your figures are true; but even if the fuel cost is twice the amount you claim, the operation of the "Cabinet" costs only about one-third as much as a charcoal broiler.

Congratulating you on your broiler and burner and wishing you great success,

Very truly yours,
The Golden Pheasant

This is, indeed, highly complimentary and is only one of many such letters the company has received since taking up the manufacture of this splendid oil burning outfit. There are many things to be said in favor of the cabinet broiler and range:

First. The saving on the cost of oil over charcoal will amount to over $600 per year. That item alone will pay for the broiler in less than six months.

Second. Its ability to turn out work in one-half the time required by any other method; that increases the seating capacity of the place.

Third. The broiler takes up less floor room, gives out very little heat, the entire absence of flame and smoke during the cooking process insures the absence of that burned and smoky taste so often noticed on a broiled or fried steak or chop. All the fat that comes from the meat while cooking is saved, and will amount to a good deal more than one would imagine in the course of a week.

Fourth. First, last and all the time: there is no comparison between anything cooked in the cabinet broiler and a charcoal broiler.

In addition to the cabinet broiler, Mr. Johnson manufactures oil burners for kitchen ranges, the Johnson fire-box burner and a natural draft burner—no steam, compressed air or forced draft is necessary with this simple, well designed burner.

Johnson's fire-box burner is now used in the cooking ranges of the leading hotels and restaurants in California, and is giving better results, has displaced more burners by economy tests, and will properly handle lower grade oil than any other gravity burner on the market.

It is claimed to be the only burner that will properly handle 28° oil, and postively preserves the life of your range. It can be regulated as easily as a gas burner.

Full descriptive matter and price list will be mailed upon application.

Fire Burns Asphalt Pavement.

The damage to asphalt pavement caused by bon fires is an important factor in making repairs to the pavement in New York City. During 1908 15,260 square yards of asphalt pavement under guarantee was damaged by bon fires in the Borough of Manhattan. The cost of repairing was $28,157. In addition to this there was considerable damage done to pavements out of guarantee. Exact measurements were made of the damage done to the pavement by fires on election night and it was found that 8,547 square yards had been damaged in the streets under guarantee and 5,262 square yards in the pavements out of guarantee. To repair this damage cost $24,028. The yardage of pavement under guarantee damaged in 1907 by bon fires was about 27,578 square yards.

Reinforced Cement Trays.

One of the necessities of modern residences is the cement tray, which is now being installed in nearly 70 per cent of the new houses and flats in San Francisco.

There is quite a variety of makes, and of various combinations of materials, but the tray that is being manufactured by the Eastern Reinforced Cement Tray Company, of 18-20 Clementina street, San Francisco, embodies the latest improvements, and is being quite generally specified.

It is claimed for this tray that its construction is such as to add to the life, or wear, fully 50 per cent over the old style trays, while the extra cost, to the purchaser, is only about one dollar more than the ordinary cement tray. The finish, too, is smoother, which adds much to the appearance of the tray when installed.

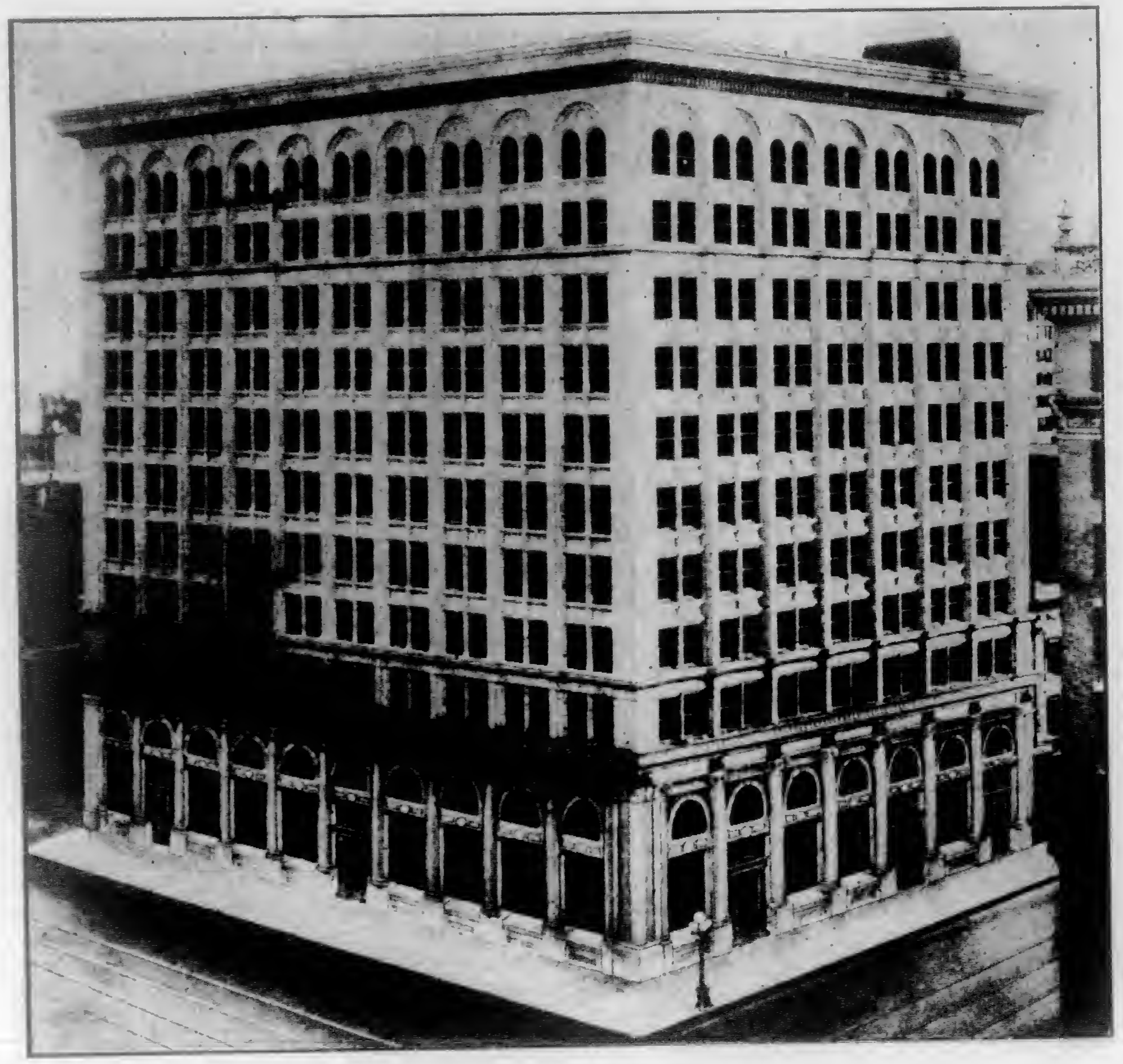
The manager of the company is Mr. P. J. M'Cauley, who has been engaged in the manufacture of trays for fifteen years, the last eight years in San Francisco. The company's business is largely local, though the Oakland business is growing rapidly, and the demand from Sacramento, San Jose, Stockton, and San Rafael is steadily increasing.

Take Offices in Hewes Building.

Architect William A. Newman has taken permanent offices on the eighth floor of the Hewes building, Market and Sixth streets, San Francisco. His telephone number is Market 301. In the same office Mr. Samuel Arnold has taken up the practice of architecture. Mr. Arnold has had considerable experience, having been at one time or another employed in the offices of William H. Weeks, Oliver & Foulkes and F. D. Voorhees of Oakland.

New Manager.

George A. Mesick succeeds Mr. N. T. Taylor as Pacific Coast representative of the Elevator Supply & Repair Company, with offices in the Balboa building, San Francisco. Mr. Mesick has been connected with this company for many years, in various capacities, and consequently is thoroughly familiar with the work.



Security Savings Bank Building, Los Angeles John Parkinson and Edwin Bergstrom, Architects
This splendid Office Building equipped with Hipolito Reversible Windows

Granted Certificates.

At the last meeting of the California State Board of Architecture, Northern district, the following applicants were examined and granted certificates to practice the profession:

A. Lacy Worswick, San Francisco.
J. Harry Blohme, San Francisco.
Vincente Legarda, San Francisco.
Willis C. Lowe, San Francisco.
Curtis Tobey, San Francisco.
Charles Clausen, San Francisco.
Edwin H. Oliver, Sacramento.

Date Extended.

The date for the submission of competitive plans for a boat house for the city of Oakland has been extended until January 1st. The competition is for draughtsmen only.

Gave Wrong Credit.

The Casa Rosa apartment house, shown in the September number of The Architect and Engineer was designed by Architect J. Cather Newsom and not by A. W. Smith, as stated in the caption.

Coxheard & Coxheard Move.

Architects Coxhead & Coxhead announce their removal from the Investors' building, San Francisco, to new offices at 333 Grant avenue (Home Telephone building), where they will continue the general practice of architecture.

Auxiliary State Fair Honors.

The Auxiliary State Fair, which was held at Idora Park, Oakland, and which closed Saturday, October 2d, was a success in every particular.

The building trades were represented, mainly, by the manufacturers of heating apparatus, who made a splendid showing.

The Pittsburg automatic water heater was awarded the gold medal, and a diploma was given the Pittsburg Lion Storage Heater System. The same firm was awarded a diploma on the Sterling gas furnace.

The Humphrey automatic instantaneous gas water heater was awarded a diploma.

The Ruud house heater was awarded a diploma, and the Ruud storage heater won a gold medal. The Excelsior gas furnace, represented by Mr. Basford, won first prize.

The Hart Heater Company, the youngest in the heating field, was awarded the gold medal for boilers, and the silver medal for their heater The Hart Heater Company has recently been established in Oakland, with offices on Thirteenth street, and manufacturing plant in the old brick candy factory on Seventh street.

The exhibit of the National Furnace Company of San Francisco was entered too late to receive an award, but the Victor Ideal gas stove attracted considerable attention from the visitors, especially the women, who were interested in its several novel features, such as convenience and economy in operation, reducing the cost of fuel some 50 per cent.

One of the exhibits that attracted much favorable comment was that of the California Mantel & Tile Company. A Flemish oak Mission cabinet mantel, with 6 inch by 6 inch green tile facing won many admiring glances. Another very attractive mantel was of California tile, brown in color, with bright iron hood and trimmings, with andirons and set to match.

The Ruud Automatic Water Heater.

It is interesting to note that among the domestic inventions which have come forward in the last few years, the Ruud automatic water heater has taken a front rank and has set a new standard of excellence for devices that are intended to provide comfort in the modern home. According to the makers, the popularity of the Ruud is best proved by the fact that very few residences are now built where these wonderful heaters are not installed. The possibility of being able to do away with the slow-heating range boiler and at the same time have an inexhaustible and instantaneous supply of hot water at command at any hour of the day or night, by simply turning on any hot water faucet in the house, and this without burning any fuel unless water is actually being drawn, and also not having the bother of lighting or putting out the heater, has made it many friends. The Ruud Manufacturing Company, who are putting out this product, also make automatic heaters for heating by hot water radiation. These heaters do away with the bother and dirt caused by coal-burning heaters and keep the house at an even temperature at all times. A further product is the Ruud multi-coil storage systems for large buildings, and constructed to handle buildings up to four hundred rooms. The factory announces that these heaters will burn oil for fuel, as well as gas. With its high heating efficiency, which commercially reaches 70 per cent of the heat units in the fuel, the saving over cast-iron boilers is so great, the fuel bill can be cut in half. In an interview, a representative of the company said:

"There are many constructive features in these heaters which excel anything that has been produced in this line. Among these features are the internal thermostat, the regulating water valve and the burners, which are constructed with a special flame check that prevents the burner from flashing or 'back-firing.' These burners are so constructed that it is impossible for one flame to impinge on the other, thus securing perfect combustion. They are very easily cleaned and, as dust is bound in time to collect in all available spaces, this is a most important point. All these points are protected by patents and found in no other device of this character.

"But the most convincing proof of the merit of the Ruud heaters, and of the reputation they have earned on the Coast, is the fact that more than twenty-five hundred Ruud heaters are 'doing business' in the Bay cities, supplying warmth and comfort to the users."

Charles Follen McKim.

Charles Follen McKim, founder of the firm of McKim, Mead & White, architects, died September 14th, at his country residence in St. James, L. I.

Mr. McKim was born in Chester county, Pa., in 1847. After a course of study at the Lawrence Scientific School, Harvard University, Mr. McKim, as a pupil of Daumet, entered the Ecole des Beaux Arts at Paris. In 1870 he returned to New York and began the practice of his profession.

In 1877 Mr. William R. Mead became a partner of Mr. McKim, and, in 1879, the late Stanford White joined the firm.

Probably no single member of the architectural profession in America has done more to uphold its dignity and secure the respect that exists throughout the civilized world for architecture in this country than has Mr. McKim.

His remarkable facility in design soon placed him in the front rank. The buildings with which his name is connected are among the best erected in this country.

Robert H. White.

The death of Robert H. White, architect, of the firm of White & Schumacher, 45 Kearny street, San Francisco, occured in St. Louis October 5th, of typhoid fever.

Mr. White had enjoyed the best of health up to a short time preceding his death. He had practiced his profession in San Francisco for the past twenty years and had made innumerable friends, both among his many clients and also among the contractors. He was a member of San Francisco Chapter, American Institute of Architects, Pacific Lodge of Masons and California Commandery.

Magnesite Company's New Plant.

A steady increase of business has compelled the California Magnesite Company to seek larger quarters and a fine plant has just been completed and occupied by the company at Slauson avenue and Regent street, Los Angeles. The old plant on Palmetto street has been abandoned. The new plant consists of a frame building, 50 by 75 feet, three stories and basement in which has been installed a complete manufacturing equipment, including an engine, motor, two crushers, pulverizers, etc.

Magnesite is a white, fireproof, waterproof, plastic, non-conducting, non-absorbing cement and especially suitable for scagliola and art marble, pressed brick, artificial granite, cement blocks, sanitary floors, sink boards, laundry trays, staff work, etc. The company manufactures and sells to the trade, its principal customers being the patent flooring people throughout the Pacific Coast. Shipments are made as far north as Seattle and as far east as Salt Lake City. Magnesite is especially desirable for artificial marble and staff and stucco work. It is extremely plastic and absolutely fireproof.

The same company also manufactures fireproof paint which has a gloss and affords the best and cheapest insurance against fire. A hardwall plaster is also manufactured. C. B. Hoadley is president of the company and F. Yale Adams is the general manager.

Philippine Mahogany Trim.

The new Funkenstein building, corner of O'Farrell and Grant Ave., San Francisco will very soon be occupied by Newman & Levinson. Lansburgh & Joseph are the architects and they have certainly designed a splendid structure. One of the most notable features of this building is the interior trim, which is entirely of Philippine mahogany. The door and window casings, stair casings, base, etc., are all in this beautiful wood and the long lengths and wide widths and absolute clearness of the boards obtainable make it an ideal wood for interior finish. One of the most noteworthy portions of the building, from an artistic point of view is the staircase. The Philippine mahogany balusters and rails show up to very great advantage. The S. H. Harmon Lumber Company did the mill work, while White Brothers, the pioneer hardwood lumber dealers, furnished the material.

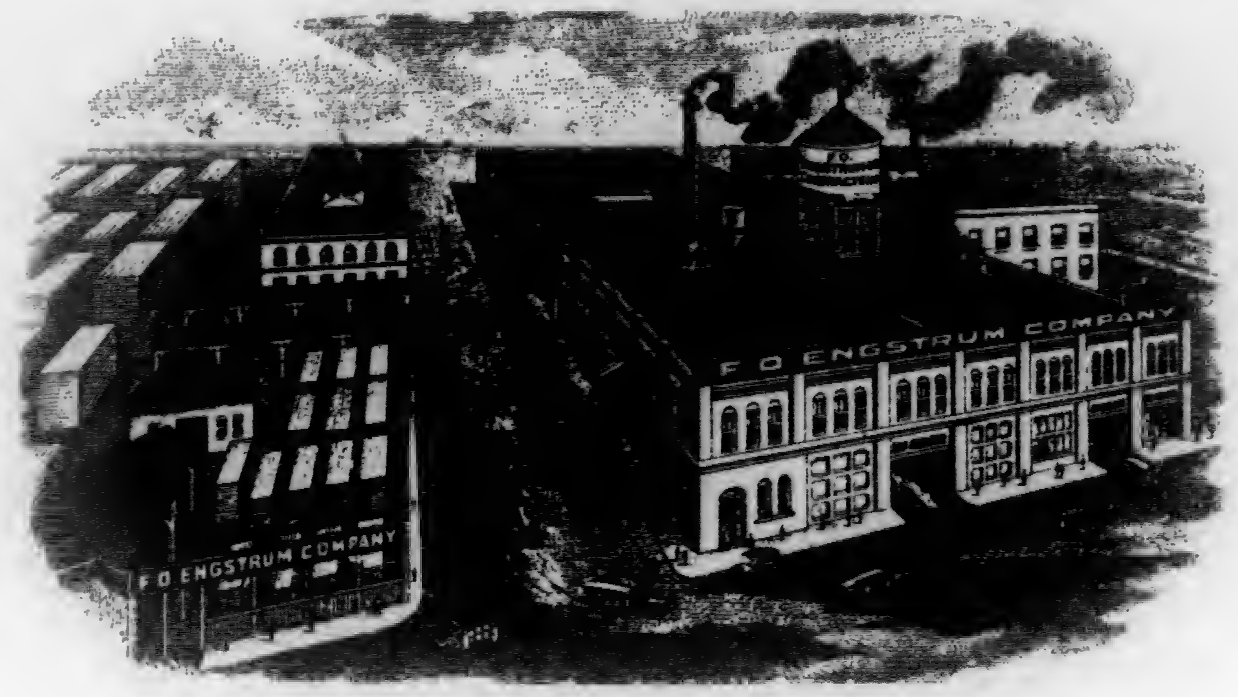
Third Edition of Kahn System Standards

The third edition of the Kahn System Standards contains 128 pages of valuable tables and information on the design of reinforced concrete. Complete theoretical discussions of the principles of design, as well as practical tables are given in convenient form. Other tables useful in designing more generally, such as bins, bridges, sewers, etc., are also given.

The third edition of Kahn System Standards contains all the matter of the previous ones and in addition many new tables. All data has been strictly revised to date.

This handbook is something very much more than an ordinary trade catalogue and is generally recognized as the standard handbook on designing.

Kahn System Standards will be furnished free to engineers, architects and builders of standing, and to others at a nominal charge.



Plant of the F. O. Engstrum Company, Los Angeles

A Well Organized Contracting Firm.

The above cut shows the splendid plant of the F. O. Engstrum Company at Los Angeles. The plant covers a total of more than a city block and is the largest and most complete maintained by any single contracting company on the Pacific Coast. Branch plants are also maintained at Agnew, San Bernardino, San Jose and Phoenix, Ariz., where extensive building is being done by the company for the State.

The F. O. Engstrum Company was organized twenty years ago. Some idea of the magnitude of its work may be had from the statement that in twelve months the company has handled as much as $4,000,000 worth of contracts. Its organization is that complete that the company handles a building from the excavation to completion, buying its materials in large quantities when the market and conditions are right, manufacturing practically everything from the raw materials so purchased, and keeping employed an average of 2,000 men.

At the present time, the organization of the management is divided as follows: F. O. Engstrum, the president, is in charge and takes personal supervision of the Northern branch, with offices and complete working organization at San Jose; the vice-president, F. E. Engstrum, is in charge of the Los Angeles general offices, with supervision over the local work and the various branch offices throughout Southern California and the Southwest; H. W. Bryson, manager, has under his supervision the clerical forces, the working forces, business and financial organization and the organization of the manufacturing departments. The buying is divided among the heads of the firm, and each officer has his specified field of executive work defined.

The company engages solely and exclusively in contracting work, devoting its entire attention to the erection of buildings. The various manufacturing departments are made to stand on their own feet as a distinct business, and while under the same general management, must show a profit for its particular department as a reason for its continued existence. These departments include brick manufacture, rock crushing, all interior mill finish for office, store and bank, etc., galvanized iron department for making cornices, gutters, downspouts, etc., staff and stucco work, planing mill, ornamental iron, complete machine shop, lumber yard, electric work. The company purchases its lumber by cargo lots, its nails by the carload when the market appears ripe, and does its own plumbing, bricklaying, plastering and electric installation.

Thoroughly organized estimating department and engineering department are maintained, with complete corps of well trained and high-priced men in charge.

The Proper Method of Driving Nails.

It is probable that very few mechanics appreciate the fact that it makes a difference whether a nail is driven home by a single blow of the hammer or whether several taps are used for the purpose. According to a writer in the Scientific American it makes a vast difference as to the way in which a nail is driven, as may be judged from the following comment:

"A fledgling mechanic, who spoke sneeringly of a man whom he heard using several blows of the hammer to drive a single nail, was somewhat crestfallen when told that the nail would hold better when driven 'home' by several light taps, than when driven by one heavy one, * * * because when you drive a nail home with a heavy blow it is apt to rebound a trifle, loosening the grip of the wood fibers on it."

Disappearing Doors.

One of the most valuable inventions of the past decade, from the builders' point of view, is the system of disappearing doors, which is really the bringing to perfection of the sliding door.

The advantages afforded by the use of the disappearing door are so great that few architects are drawing plans for city houses, where economy of space must be considered, without including the disappearing door in the specifications.

The disappearing door requires no extra thickness of wall, and is perfect in operation.

The doors are installed in the Casa Rosa apartments, Oakland, the finest apartment house in the City of Oaks; they are also in the apartment house at Sixteenth and Clay streets, recently built for the Alameda Building & Loan Association; also, in the Alexander residence, Piedmont Heights, and in many other fine residences in Oakland, Berkeley and Alameda.

In San Francisco, the Pitcher disappearing door is so generally in use in the new apartment houses and private residences, that to enumerate would require several pages of space. Prominent among the buildings, however, are the new Elks building, the Buena Vista apartments, Techau Tavern, Clinton apartments, the Richelieu hotel, and the Lundy apartments.

The Pacific Tank Company, the manufacturers of the Pitcher door, is busily engaged in filling orders for future delivery.

Well Irrigation System.

The Oregon Railroad & Navigation Company has just published a booklet entitled "Well Irrigation of Small Farms in the Willamette Valley," by Mr. R. M. Brereton of Portland, Ore. The booklet is devoted to an explanation of the well irrigation system and the advantages which may be derived therefrom.

Copies may be obtained free of charge, on application to the Portland office of the O. R. & N. Co.

Blue Print Papers.

Keuffel & Esser Company, whose head office is 127 Fulton street, New York, with branch offices in Chicago, St. Louis, San Francisco and Montreal, have been long and favorably known to architects by reason of their line of supplies for the draughting room.

They have recently issued a pamphlet, describing their perfected Helios Blue process paper, with instructions as to its manipulation, which contains information of interest and value to makers of blue prints. The pamphlet may be had on application.

An Index to the Advertisements

[Index continued on Page 120.]

Success of the Open-Shop Movement.

[From "American Industries."]

A most encouraging and satisfactory evidence of success in the national movement for the open shop is given in a weekly letter recently issued by the United Metal Trades Association of the Pacific Coast. The association prefaces a long list showing the passing of union labor in the United States Steel Corporation plants by saying:

"We wish emphatically to bring to your attention the fact that the record here given refers to skilled workmen who require years of experience or special training to attain the workmanship required, and not ordinary labor. It vividly shows just what can be done by a properly managed organization having a definite purpose in view. The record shows, furthermore, how little cause there is for the alarm of the individual firm or even community which hesitates to join the great army of open-shop plants because of a fear of consequences."

The list quoted covers the period (inclusive) between 1901 and 1909. In the first year the steel corporation employed 60,000 union and 40,000 non-union men. After the great strike of 1901 these figures were changed to 46,000 union and 55,000 non-union employes. A year later the Youngstown strike and the deserting of all the American steel hoop mills again altered the balance to 36,000 union and 70,000 non-union men. In 1905, after the National Bridge Company had banished the Amalgamated, the structural iron workers and union machinists, there remained in the corporation's employ only 24,000 union men, while the non-union forces had increased to 84,000. Three years later, labor troubles caused the corporation to shut down six union plants, dismantle them and ship the machinery to non-union factories, with a telling reduction in the union forces of 15,000 men, and an increase in the non-union pay-roll to 94,000. Today, with the practical lock-out of the Amalgamation Association men, and every union mill shut down, the company is putting on extra forces at its non-union plants, with the probable result of 120,000 men at work entirely under open-shop rules. The significance of this condition is beyond question. As an object lesson to employers everywhere it is invaluable.

Paradux Roofing.

W. P. Fuller are the exclusive sales agents in California of the J. A. & W. Bird roofing materials. A roofing that is growing more and more popular with architects and builders is "Paradux," especially designed for galleries, roof gardens, porch and veranda roofs, piazza floors or any roof that is to be walked on.

Paradux roofing can be painted any fancy color without injurious effect. In painting in any but very dark shades on ordinary prepared roofing, tarred paper, etc., the oil in the paint softens the coating, and the hot sun draws the dark compound through the paint, thereby discoloring it.

Paradux roofing comes in three grades; a selection of these can be made according to the requirements of the work to be done.

The upper side of Paradux roofing is covered with a heavy sheet of closely woven duck. This is affixed securely to a solid waterproof sheet of felt. When the roofing is laid and painted, it makes

ADVERTISERS' INDEX—Continue from Page 117

an impervious covering, which, we believe will outlast any prepared roofing yet manufactured, providing it is given a coat of paint from time to time.

Gold Medal for Pittsburg Boiler.

Editor The Architect and Engineer—It may be of interest to you and the readers of your widely read publication to know that the "Pittsburg" automatic water heater was awarded a gold medal as first prize over all other automatic heaters at the California State Fair, held at Idora Park, Oakland, September 18th to October 2d, which is all the more impressive from the fact that a vigorous protest was made against the original decision of the judges, and after a second inspection and demonstration they were more emphatic than ever in having their original award stand, as the superiority of the "Pittsburg" left no question in their minds.

The "Pittsburg" water heater is manufactured by the most practical and expert hot water mechanics in the country, and that they have produced a machine that for efficiency and economy of operation is unequaled, is evidenced by the giving of this gold medal by a jury of practical and impartial judges.

The "Pittsburg" water heater was first introduced in San Francisco and the surrounding cities about eighteen months ago, and our record, of which we feel proud, is that over 1,000 heaters are in daily operation, testifying to the continued satisfaction our heaters are giving, and we assure the architects and the public in general that our aim is to make every heater a perfect heater and to give the high-grade excellent service for which it is built.

Yours very truly,
JOS. THIEBEN & CO.,
Agents Pittsburg Water Heater Co.
By JOS. THIEBEN.

Putting Up Substantial Buildings.

The lower end of Broadway, in Oakland, has always been more or less unsightly, with its numerous shacks and cheap wooden buildings, giving the visitor a not altogether favorable impression of the town. Recently owners of property in that section of the City of Oaks have become imbued with the spirit of improvement, and are building modern buildings. At the corner of Broadway and First street, a Class A structure, to be used for hotel purposes, has recently been started, and on the adjoining lot, on Broadway, Mrs. Agnes Borland is having a Class A three-story building built, the plans of which were drawn by Morgan & Hoover of San Francisco.

The foundation is of reinforced concrete and the front of the building is to be of pressed brick, supplied by the Los Angeles Pressed Brick Company.

The lower floor will have two stores and a cigar stand; the upper floors will be used for a rooming house.

This building, when finished, will improve the appearance of that section very much, and being directly opposite the Broadway Station, should be an excellent business location. Mr. Louis J. Larson, the general contractor, expects to have the building completed in December.

Malthoid at the Seattle Fair.

The Paraffine Paint Company has just published an attractive booklet containing some splendid half-tones of the Seattle Fair buildings, which are covered with Malthoid roofing. The following introductory makes interesting reading:

"Mind is everything.

"Thought creates a world of things.

"From the minds of Seattle's best men the great and successful Alaska-Yukon-Pacific Exposition was created.

"It was a wonderfully fine fair, because master minds made it so.

"It was the creative thought of these men which gave so much pleasure and amusement to millions of visitors and made much profit for a progressive city.

"Concentrated, accumulated thought of many minds for twenty-six years has developed Malthoid roofing.

"The patience and thought which looks to higher things than temporary success, perfected Malthoid and made it complete for every necessity and requirement known to roofing.

"And when the creative, master minds of the Alaska-Yukon-Pacific Exposition wanted certainty of roofing protection against the frequent summer rains, followed by usual summer heat (most vicious enemies of roofs) they naturally selected Malthoid.

"Over 1,000,000 sq. ft. of it were used.

"Piqued and disheartened competitors, who bite at the heels of progress, never seem to realize that there are higher considerations in business than merely making money, and if the right thought will develop a perfect roofing, successful business naturally follows.

"Great is thought, for it rules the world and created Malthoid roofing."

Stone & Smith Dissolve Partnership.

The architectural firm of Stone & Smith, Mechanics' Bank building, San Francisco, has dissolved partnership. Stone & Smith are well known throughout California as the architects of some of the handsomest school houses in the Golden State. They have also designed a number of very creditable library buildings, besides many fine apartment flats and residences. Mr. Henry C. Smith will retain the offices in the Mechanics' Bank building.

New Offices for Dickey & Reed.

Architects Dickey & Reed have moved their San Francisco office from the Balboa building to suite 337-9 Russ building, corner Pine and Montgomery streets. The Oakland office will be continued and a branch office will also be maintained at Sacramento, the firm having plans out for a handsome four-story hotel to cost $100,000.



Interior Light Court of Whitney Building, San Francisco
Veneered with American Encaustic Tiling Company's Bright White Glazed Brick-Tile.

The Use of Brick-Tile for Veneering a Light Court.

The problem of finishing a light court seems to have been solved by the use of bright white glazed brick-tiles for a veneer. The Whitney building in San Francisco is one of a number of light courts that have been veneered with this excellent material and the result is extremely fine. The owners of the building say the light in the lowest inside rooms is so great that they do not find it any darker in the rooms on this floor than those on the top floor of the court, and, furthermore, they are practically as light as the outside exposures. The visual aspect of the court is most attractive also.

The brick-tiles are of such a beautiful glistening whiteness that there is a most striking contrast with a court veneered with the ordinary glazed brick or terra cotta. It would well be worth the while of any interested person to inspect this light court. If some of the many dingy concrete finished light courts were veneered with this material, the increased light and beauty of such finish would demand better rents and more tenants and prove a splendid investment to the owner.



Showing part of the Lynwood Exhibit at the State Fair, Oakland

A New Interior Finish.

OF THE many interesting exhibits at the State Fair held at Idora Park, Oakland, none attracted more attention or received so many favorable comments, as the display of the National Lynwood Company of 310 California street, San Francisco. The public is always interested in something new, and when it has to do with building material, the interest is keener still. Lynwood is a mechanical reproduction of hardwood finish, and a mighty clever one, too. The judges at the fair thought so, at any rate, for they unhesitatingly awarded the exhibit a gold medal and several coveted diplomas. The cut shown herewith is made from a photograph of part of the exhibit at the fair, and gives one a fair idea of the possibilities of Lynwood for interior finish.

Lynwood is identical in effect and appearance to hardwood, is reproduced on a chemically treated wood fibre pulp substance, subjected to a great hydraulic pressure. It is manufactured in different thicknesses necessary to fill the various uses and requirements in the interior finishing of buildings.

Here are some of the practical reasons offered by the manufacturers why Lynwood should be used:

"Lynwood products are pulp fibre products, and these are recognized as superior for a building material and various other uses requiring strength and durability.

"The non-conductive qualities of heat, cold and sound are commendable and important for a wall covering. In this respect the qualities of Lynwood are unrivaled by any other material now used for this purpose.

"The chemical process of manufacture makes these products proof against vermin and other unsanitary features.

"They have strength, firmness and elasticity; cracks so commonly seen in plaster walls are obviated; the falling of ceilings and walls from earthquakes would be impossible.

"The time required for completing buildings is greatly reduced, as work can proceed immediately after frame is erected; boards can be omitted for plumbing and wiring.

"You can occupy rooms at night completed during the day, as there is no waiting for drying walls, as is necessary when plastered.

"Your building remains clean, as there is no litter and dirt and staining of floors.

"You are enabled to obtain the most artistic results for interior finishing, be it a home, club-room, store, or any other building.

"You are only limited by your taste and ability to design and execute the erection and finishing. You will find these products not only the most practical and artistic, but the cheapest in dollars and cents of any material used for this purpose."

Lynwood is made very light and pliable and adapted to veneer (paste on) any smooth surface, either plain, concave or irregular shapes, such as mouldings, etc., necessary to carry out hardwood designs and effects.

Lynwood boards are used to line the walls and ceilings of interiors by nailing same directly to the studding, then covering the joints with Lynwood battens. The result is an artistic finish in hardwood panel effect. These boards are about one-fourth inch thick, weighing six pounds per square yard, making a strong and firm wall covering, and can be applied by any one with a saw or knife and hammer.

Lynwood and Lynwood boards are always used where hardwood effects are desired, and when erected are finished the same as hardwood, in either shellac, wax or varnish, and can be rubbed with pumice stone to the finest polish, if desired.

A special thickness of Lynwood is made for paneling (pasted on) over hard finish plaster walls. Also a special thickness for hardwood border effects on floors.

Blank boards are the same as Lynwood boards in thickness and quality and are nailed directly to the studding as a wall covering, but the surface has no Lynwood finish, and are used where no wood effect and finish is wanted.

After being erected, if natural color is not satisfactory, they can be either papered, tinted, painted or decorated the same as plaster walls, at considerable less expense.

Lynwood products are made in two widths, 24 and 32 inches. The length of boards are 8 to 15 feet, which gives any length without waste.

END OF VOLUME

VOLUME #
19

THE ARCHITECT & ENGINEER

of California — Pacific Coast States

NOV.

NOVEMBER FEATURES

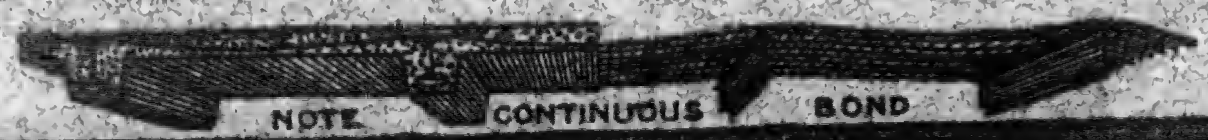
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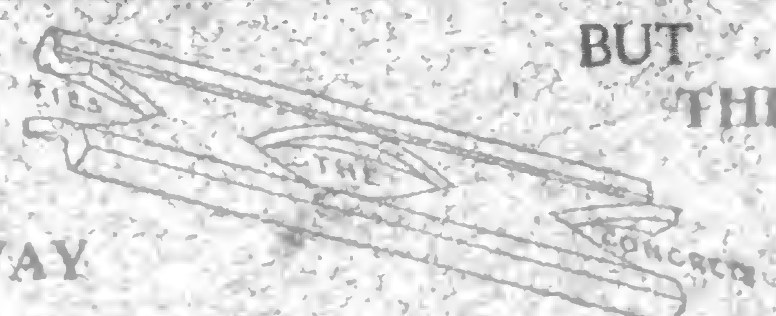
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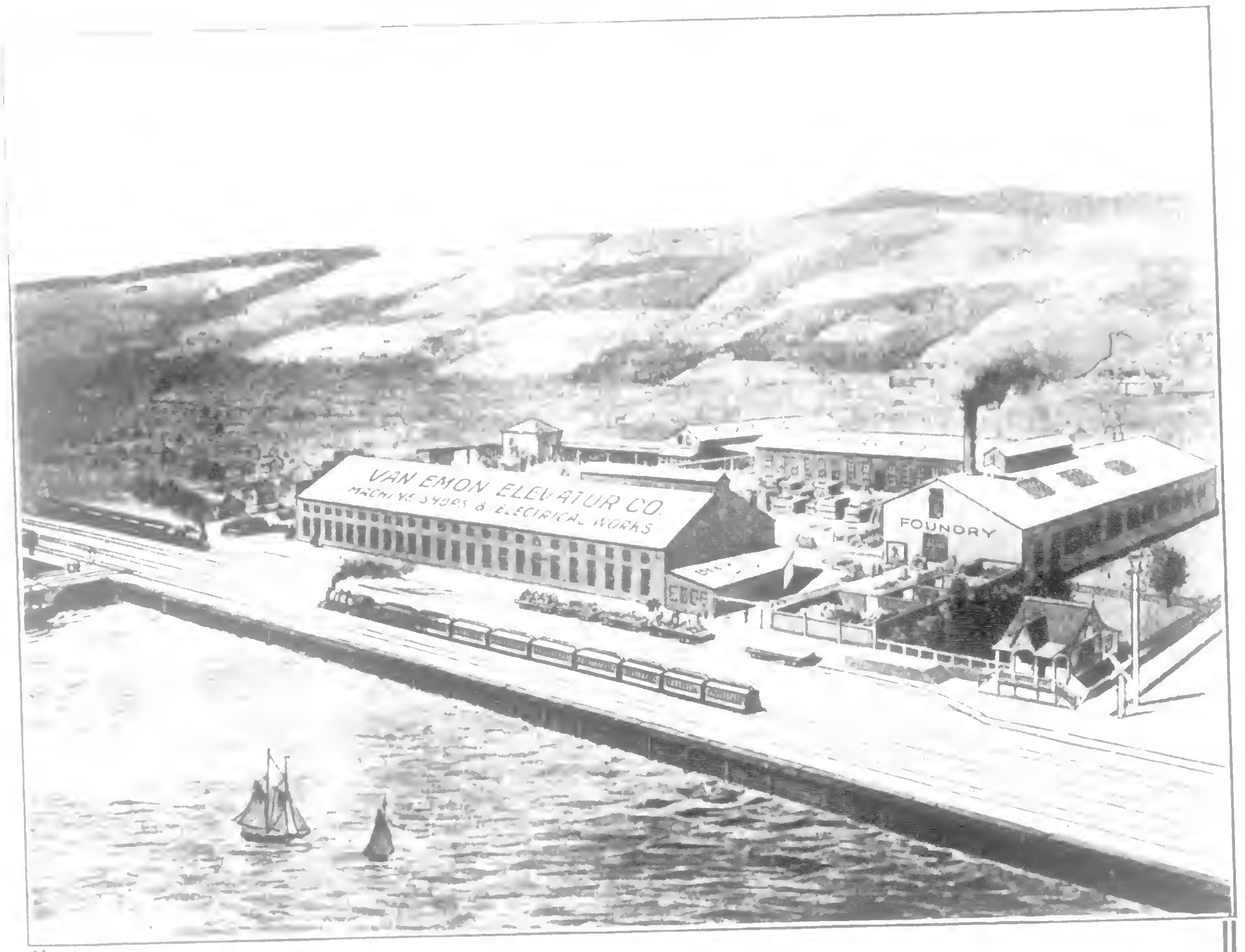


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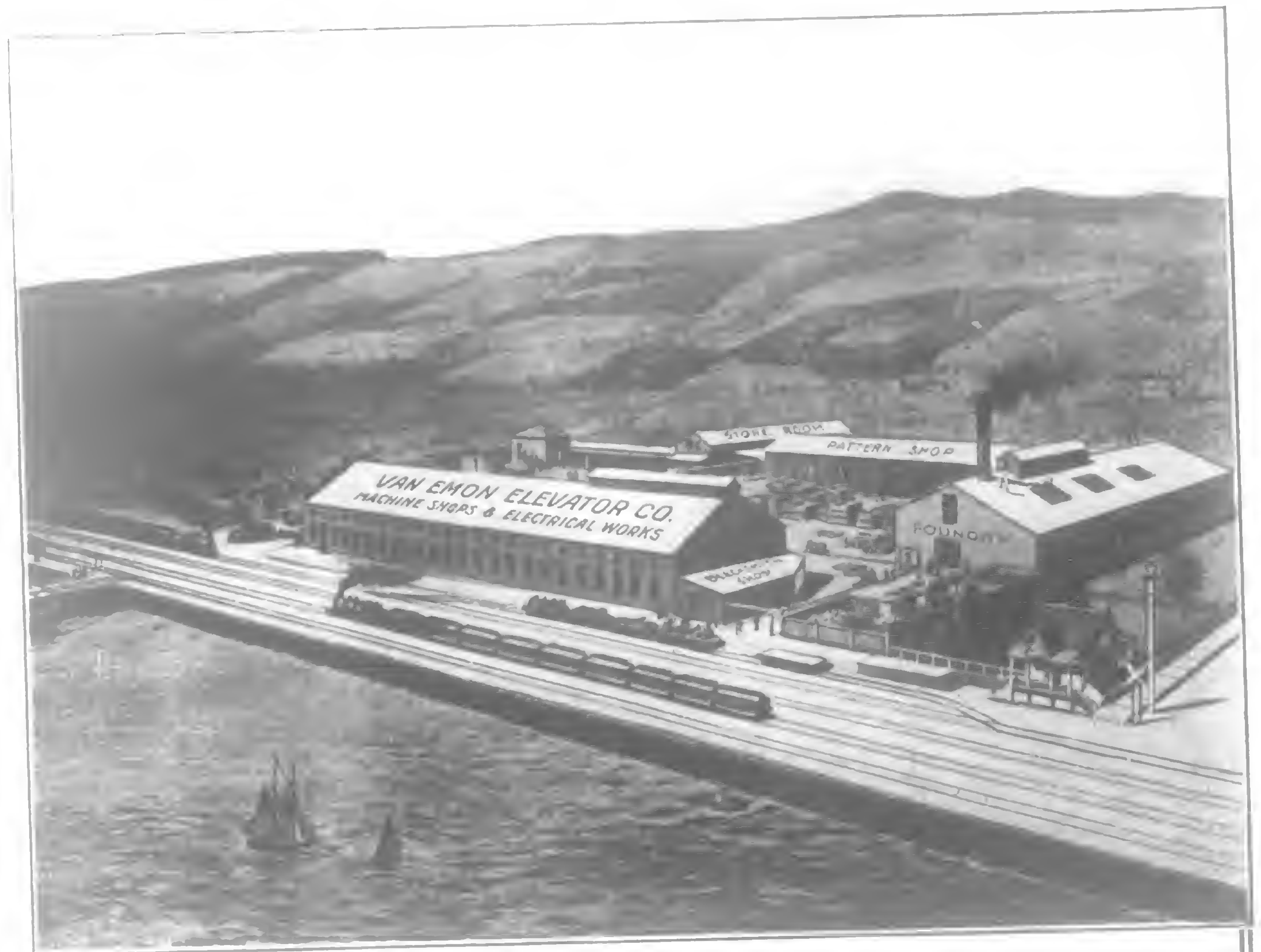
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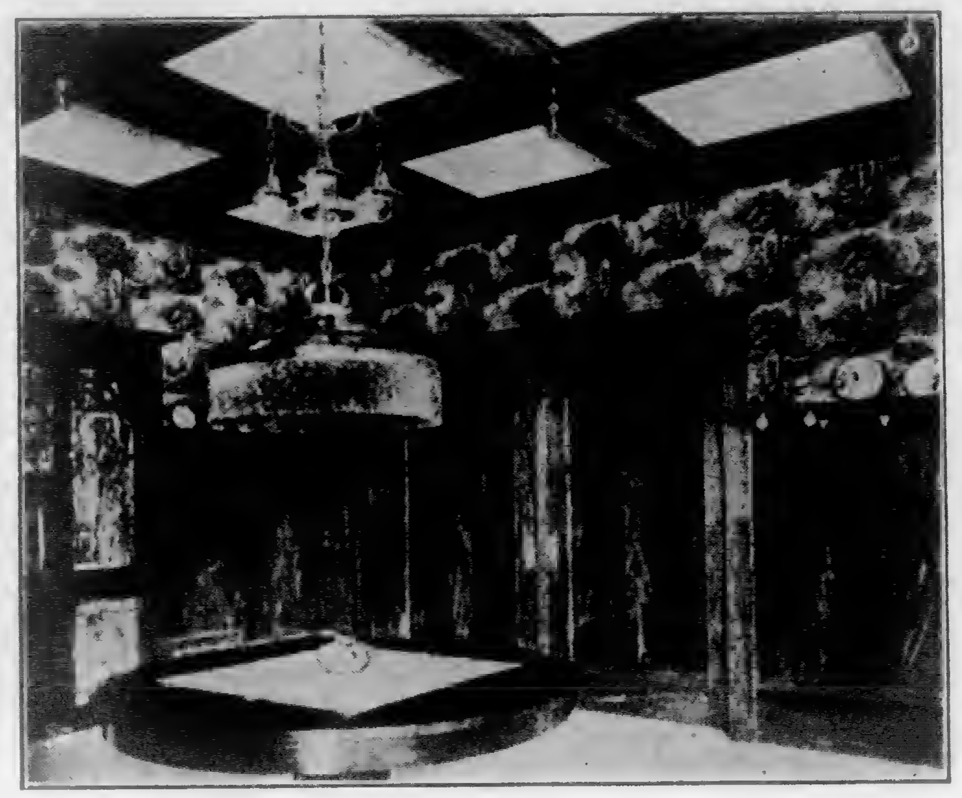
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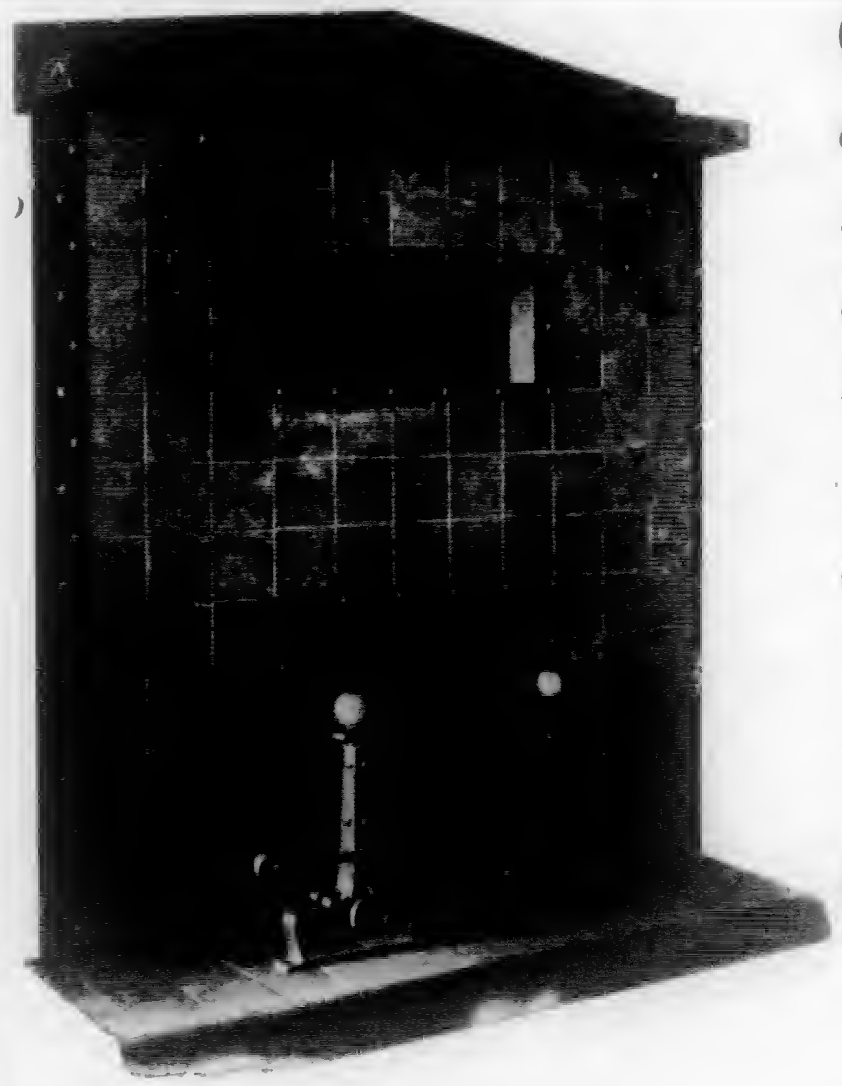
NEW WASHINGTON HOTEL, SEATTLE.
Eames & Young, Architects.



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In Warehouses, Factories, Stables and the like, the flooring that resists hard wear and chemical action and needs no repairing during the life of the building, is the one that ***really pays*** the Owners or Operators.

It pays because it cuts down maintenance expense and reduces depreciation of plant.

It is the ***cheapest*** no matter what its cost of installation.

Baker & Hamilton are responsible and conservative people — their experience with "Watsonite" makes it at least worth an investigation.

READ THEIR LETTER:

Answering your request for our opinion of the Watsonite Flooring laid on the drive-way and wash-rooms of our new building, will say that this flooring has been subjected to hard usage and the severest test during the past six months, proving itself satisfactory, and up to the present time it has shown no visible signs of wear.

Some time ago we had occasion to load a truck with machinery, and when the load was put over the public scales, it showed a gross weight of 18,430 lbs. The fact that the team started this load and the tires left no mark on the pavement, is proof of the quality of your flooring.

Yours truly,

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Send for explanatory booklet, and specifications letter-size and neatly bound all ready to file. Also small sample.

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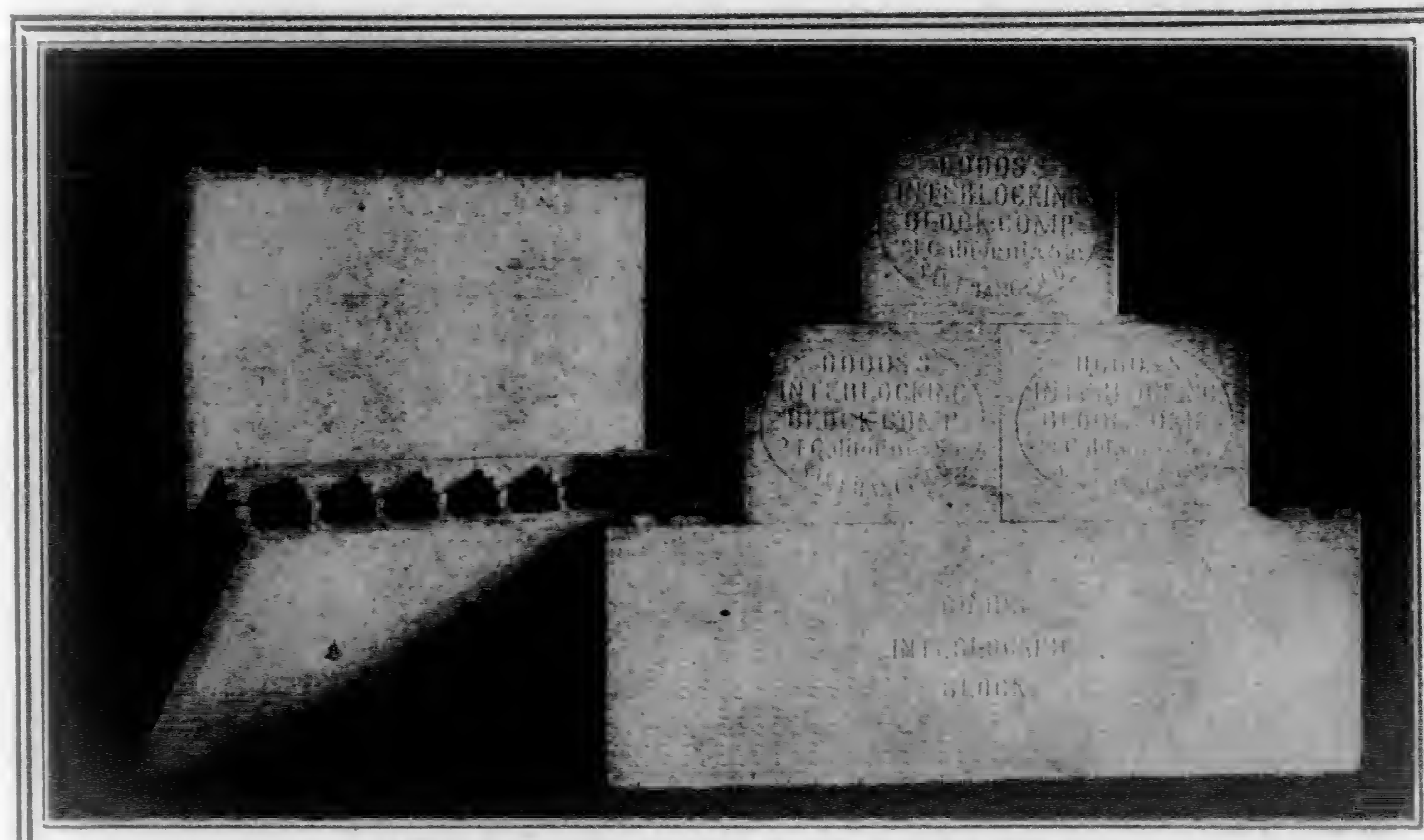
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ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see page 117)





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F. T. Crowe & Co., Seattle, Tacoma, Spokane and Portland
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Clinton Fireproofing System, L. A. Norris, Monadnock Bldg., S. F.
Corrugated Bars sold by John B. Leonard, C. E. Sheldon Bldg., S. F.
Lilley & Thurston Co....82 Second St., S. F.
International Fabric & Cable, represented by Western Builders' Supply Co., 680 Mission St., S. F.
Arthur Priddle........133 Geary St., S. F.
Kahn System.......S. F., L. A. and Portland
Twisted Bars sold by Woods & Huddart....356 Market St., S. F.

CONCRETE SURFACING
"Concreta" sold by W. P. Fuller & Co., S. F.
"Glidden Liquid Cement," sold by Glidden Varnish Company, Cleveland, O.

CONTRACTORS, GENERAL
Taylor & Johnson, Postal Telegraph Bldg., S. F.
Standard Construction Co., Hooker & Lent Bldg., S. F.
Reardon-Crist Co..1166 Webster St., Oakland
W. H. Bagge & Son, Inc., Balboa Bldg., S. F.
Esterley Construction Co......Berkeley, Cal.
C. A. Brady Builders' Exchange, S. F. and Menlo Park
Laughland & Schnebly Co., 1443 Broadway, Oakland
Lange & Bergstrom, Monadnock Bldg., S. F.
Metropolis Construction Co., 34 California St., S. F.
F. O. Engstrum Co., Los Angeles and San Jose, Cal.
N. H. McKay 274 Ninth Ave., Richmond, S. F.
Hoyt Bros., Builders' Exchange, S. F., and Santa Rosa
P. Peterson..................Fruitvale, Cal.
Louis J. Larson....1231 Chestnut St., Oakland

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL.
- Ransome Concrete Co....Crocker Bldg., S. F.
- Northwest Bridge Works, Fifteenth and Front Sts., Portland
- Redmond, De Luca & Barzellotti, 268 Montgomery St., S. F.
- Gutleben Bros..944 Monadnock Bldg., S. F.
- Webster-Mace Construction Co., Merchants' Exchange Bldg., S. F.
- E. D. Crowley Co., 127 Montgomery St., S. F.
- Rickon-Ehrhart Eng. & Const. Co., 1859 Geary St., S. F.
- Wm. A. Butler & Co....660 Market St., S. F.

CORKBOARD INSULATION
- Armstrong Cork Co....693 Mission St., S. F.

CORNER BEAD
- Boyd & Moore........356 Market St., S. F.
- Parker Corner Metal Bead sold by J. W. Richards......Metropolis Bank Bldg., S. F.
- "Prescott" sold by Boyd & Moore, 356 Market St., S. F.

CORNICES
- Chas. S. Amsler.......25 Shotwell St., S. F.

DAMP-PROOFING COMPOUND
- Boyd & Moore........356 Market St., S. F.
- "Pabco" Damp Proofing Compound sold by Paraffine Paint Co.....38 First St., S. F.
- H. D. Samuel Company, 23 Valencia St., S. F.
- "Protectorine," Compound, sold by Boyd & Moore ....356 Market St., S. F.
- R. I. W. sold by Willkomm Supply Co., 151 Tehama St., S. F.
- "Protectorine," sold by Boyd & Moore........356 Market St., S. F.

DISAPPEARING BEDS
- Holmes Disappearing Bed Company, 687 Monadnock Bldg., S. F.

DOOR OPENER
- G. Rischmuller..........Builders' Ex., S. F. and 842 37th St., S. F.

DOOR HANGERS
- Pitcher Door Hanger sold by Pacific Tank Co............318 Market St., S. F.
- Reliance Hangers.............(see page 147)

DOORS—METAL
- Waterhouse & Price......59 Third St., S. F.
- Portland Sheet Metal Works, E. 7th and E. Madison Sts., Portland
- "Cross" Fireproof Horizontal Folding Doors, Boyd & Moore......356 Market St., S. F.

DOORS—REVOLVING
- "Van Kannel" Revolving Doors, Boyd & Moore......356 Market St., S. F.

DOORS—VENEER
- Northwest Door Co., Albina Ave., Portland

DRILLS, BRICK AND STONE
- Star Expansion Bolt Co., 1010 Howard St., S. F.

DUMB WAITERS
- Wells & Spencer Machine Co., 139-141 Beale St., S. F.

ELECTRICAL CONTRACTORS
- Camino Electric Co.1715 Greenwich St., S. F.
- Central Electric Co..185 Stevenson St., S. F.
- Hanbridge-Loyst Electric Co., 77 Sutter St., S. F.
- Butte Engineering Co..683 Howard St., S. F.
- A. C. Thode........251 Stevenson St., S. F.
- Western Electric Works, 61 6th St., Portland, Or.
- Oregon Engineering Co. Beck Building, Portland, Or.
- Latchem Engineering & Electric Co., 214 Ellis St., S. F.

ELEVATORS
- Van Emon Elevator Co., 54 Natoma St., S. F.
- Wells & Spencer Machine Co., 139 Beale St., S. F.

ELEVATOR CARS
- Cleveland Art Metal Co., Boyd & Moore, Agents, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
- Elevator Supply & Repair Co., 593 Market St., S. F.

ENGINEERS
- W. E. Leland..Merchants' Exch. Bldg., S. F.
- Thos. Morrin............Balboa Bldg., S. F.
- Thos. B. Leonard........Sheldon Bldg., S. F.
- W. W. Breite...........Clunie Bldg., S. F.
- Cox & Vengelen.......229 Pine St., Portland
- F. J. Amweg, C. E., 700 Marston Bldg., S. F.

EXPRESS CALL SYSTEM
- Elevator Supply & Repair Co., 593 Market St., S. F.

FIRE ESCAPES
- Standard Iron Works.........Portland, Ore.

FIRE EXTINGUISHERS
- Goodyear Rubber Company, 587- 591 Market St.,S. F.

FIREPROOF PARTITIONS
- Dodds' Interlocking Block Co., 24 California St., S. F.

FIREPROOFING
- Roebling Const'n Co..Crocker Bldg., S. F.
- San Francisco Fireproofing Company, Collins' system..Metropolis Bank Bldg., S. F.
- California Fire Proof Construction Co. 614 F. P. Fay Bldg., Los Angeles, Cal.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FIREPROOF FLOORING
- Carrelin Asbestos Co........Sunnyvale, Cal.

FIREPROOF SHUTTERS AND DOORS
- McCormick-Henderson Co., Postal Telegraph Bldg., S. F.

FIRE PROTECTION
- Goodyear Rubber Company, 587-591 Market St., S. F.

FLOOR FINISH
- Standard Varnish Works, Chicago, New York and San Francisco

FLOOR POLISH
- Butcher's Boston Polish Co., 356 Atlantic Ave., Boston, Mass.

FLOORING—ENGLISH BLOCK FLOOR
- Jas. G. Wilson Mfg. Co., 3 W. 29th St., New York, and McCormick-Henderson Co., Postal Telegraph Bldg., S. F.

FLOORING COMPOSITION
- California Magnesite Co., Slauson ave. and Los Angeles
- Carrelin Asbestos Flooring Co., Sunnyvale, Cal.

GLASS—PRISM, ART, ETC.
- California Art Glass Works 768 Mission St., S. F.
- United Glass Co.........115 Turk St., S. F.
- Willkomm Building Supply Co., 151 Tehama St., S. F.
- W. H. Judson Art Glass Co. 720 S. Broadway, Los Angeles, Cal.
- Munich Art Glass Company, Inc., 667 Mission St., S. F.
- San Francisco Art Glass, 944 Mission St., S. F.

GRAVEL, SAND AND CRUSHED ROCK.
- L. E. Chattock........1087 Natoma St., S. F.
- Chas. P. Nott..379 Alma St., Palo Alto, Cal.
- California Bldg. Material Co., Pacific Bldg., S. F.
- Leona Chemical Co..1256 Broadway, Oakland
- Grant Gravel Co.........87 Third St., S. F.

HARDWOOD AND INLAID FLOORS
- Inlaid Floor Co..........398 Eddy St., S. F.
- Boyd & Moore......356 Market St., S. F.

HARDWOOD LUMBER
- E. A. Howard Co......20 Howard St., S. F.
- Brown Lumber Co. First St., bet. Washington & Clay, Oakland
- White Brothers, Cor. Spear and Howard Sts., S. F.
- Dieckmann Hardwood Co., Welch Bldg., S. F.

HARD WALL PLASTER
- Regan hard wall plaster, Mound House, Nev.
- Standard Supply Company, First St. and Broadway, Oakland
- Reno Hard Wall Plaster, sold by Western Building Material Co., 340 Steuart St., S. F.
- Adamant Co......Worcester Bldg., Portland
- Nevada Gypsum Hard Wall Plaster Co., Pacific Bldg., S. F.

HEATERS—AUTOMATIC
- Ruud Manf'g Co., 428 Sutter St., S. F.; 651 S. Hill St., L. A.; 294 Yamhill St., Portland, Ore.
- Hart Heater Co., State Savings Bank Bldg., 13th and Franklin Sts., Oakland
- Humphrey Co., 565 N. Rose St., Kalamazoo, Mich.
- Pittsburg Water Heater sold by Thos. Thieben & Co....585 Mission St., S. F.
- John Wood Mfg. Co., 741 Cypress St., Oakland

HEATING AND VENTILATING
- Hart Heater Co., State Savings Bank Bldg., Oakland
- A. W. Curry.....116 Grand Ave., Portland
- Robert Dalziel Jr. Co., 418 13th St., Oakland
- California Hydraulic Eng. & Supply Co., 523 Market St., S. F.
- Burness & Martin, 129 Sixteenth St., Portland
- T. C. Thronson, 415 Hawthorne Ave., Portland
- Thos. E. Hulme & Co., 275 Fifth St., Portland
- C. L. Johnson & Co., 285 Grand Ave., Portland
- Machinery and Electrical Co., 351-353 N. Main St., Los Angeles
- Silva Heating & Plumbing Co., 140 First St., S. F.
- Solar Heater Co., 333 New High St., Los Angeles
- Mangrum & Otter, Inc., 507 Mission St., S. F.
- John G. Sutton Co., 229 Minna St., S. F.
- Gilley-Schmid Co., Inc., Thirteenth and Mission Sts., S. F.

HEATING ENGINEERS
- Cox & Vengelen, 229 Pine St., Portland, Ore.
- W. E. Leland..Merchants' Exch. Bldg., S. F.

HINGES
- Stanley's Ball-Bearing Hinges,Stanley Co., New Britain, Conn.

HOTELS
- Hotel Stewart, Geary, near Powell St., S. F.
- Fairmont Hotel, California and Powell Sts., S. F.

IMITATION HARDWOOD
- National Lynwood Company, 310 California St., S. F.

IMITATION STONE
- C. Menzer & Son......862 Howard St., S. F.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 425 Washington St., S. F.
- Pacific Laboratories, Inc., 558 Market St., S. F.

INSURANCE
- Pacific Surety Co..326 Montgomery St., S. F.
- Voss, Conrad & Co..Modnadnock Bldg., S. F.

INTERIOR DECORATING
- L. Tozer & Son Co., 228 Grant Ave., S. F.
- C. E. Gordon..........1235 Pierce St., S. F.
- Schastey & Vollmer..1930 Van Ness Ave., S. F.
- W. W. Tucker, Fourteenth and Webster Sts., Oakland
- Pfister & Co............169 Grove St., S. F.

JOIST HANGERS
- Western Builders' Supply Co., 680 Mission St., S. F.

LAUNDRY TRAYS
- Eastern Reinforced Tray Co., Eighteenth and Clementina Sts., S. F.
- Peerless Mfg Co....364 Eleventh St., S. F.

LIME
- Standard Supply Co., Oakland First St. and Broadway, Oakland

LIGHTING FIXTURES
- Geo. R. Greenleaf, 2107 Addison St., Berkeley
- The Enos Company..1748 California St., S. F.
- Adams & Hollopeter....745 Mission St., S. F.
- Morrison Electric Co., 291 Morrison St., Portland

LOCKERS—METAL
- Boyd & Moore......356 Market St., S. F.

LUMBER
- Santa Fe Lumber Co. Seventeenth and De Haro Sts., S. F.

MACHINERY AND MACHINERY SUPPLIES
- California Hydraulic Eng. & Supply Co., 523 Market St., S. F.
- Machinery and Electrical Co., 351 N. Main St., Los Angeles
- Steiger & Kerr Stove & Foundry Co., Folsom and 18th Sts., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

MAGNESITE
California Magnesite Co.,
Slauson Ave., Los Angeles

MAILING CASES
Mailing Case Mfg. Co., 264 Natoma St., S. F.

MANTELS
Mangrum & Otter......561 Mission St., S. F.
W. W. Montague & Co., 557 Market St., S. F.

MARBLE
Joseph Musto Sons—Keenan Co.,
535-565 North Point St., S. F.
Italian & American Marble Works,
Sixteenth and Carolina Sts., S. F.
Western Magnesite Development Co.,
Metropolis Bank Bldg., S. F.
Columbia Marble Co., 268 Market St., S. F.
Vermont Marble Works, Brannan St., S. F.
587-591 Market St., S. F.

MASONS.
T. F. O'Rourk..........180 Jessie St., S. F.
Ferdinand Wagner......607 Waller St., S. F.

MATTING RUBBER AND TILING RUBBER
Goodyear Rubber Company,

MECHANICAL ENGINEER
Thomas Morrin..........Balboa Bldg., S. F.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co..........296 Eleventh St., S. F.
Western Art Metal and Iron Co.,
405 Sixth St., S. F.

METAL AND STEEL LATH
"All United Steel Studding,"
Lilley & Thurston Co..82 Second St., S. F.

METAL DOORS AND WINDOWS
Waterhouse & Price......59 Third St., S. F.
Portland Sheet Metal Works, Portland, Ore.

METAL SHINGLES
Meurer Bros., represented by J. A. McDonald....Builders' Exchange Bldg., S. F.
San Francisco Metal Stamping & Corrugating Co..........296 Eleventh St., S. F.
Portland Sheet Metal Works,
E. 7th and E. Madison Sts., Portland, Ore.

MILL WORK
Enterprise Mfg. Co............Stockton, Cal.

MOTORS, GENERATORS, ETC.
Western Electric Works,
61 Sixth St., Portland, Ore.

OFFICE BUILDING DIRECTORIES
McCormick & Henderson,
Postal Telegraph Bldg., S. F.

OIL BURNERS
Dietert Swenson Co.....80 Tehama St., S. F.
G. E. Witt Co.........850 Howard St., S. F.
S. T. Johnson Co., 1334 Mission St., S. F.

OPERA CHAIRS
Spencer Desk Co....Monadnock Bldg., S. F.
C. F. Weber & Co.,
365 Market St., S. F.

ORNAMENTAL CEMENT WORK, CAPITALS AND BRACKETS
D. Ross Clarke....Builders' Exchange, S. F.
Western Builders' Supply Co.,
680 Mission St., S. F.

ORIENTAL GOODS
Sing Fat Co.,
Dupont and California Sts., S. F.

ORNAMENTAL IRON AND BRONZE
Golden Gate Structural & Ornamental Iron Works............1435 Mission St., S. F.
Vulcan Iron Works....604 Mission St., S. F.
Chr. Deterding......67 Clementina St., S. F.
Western Builders' Supply Co., Representing The L. Schreiber & Sons Co., Cincinnati
J. G. Braun.........Chicago and New York
Sartorius Co., Inc..16th and Utah Sts., S. F.

PAINT FOR CEMENT
Velvoleti Cold Water Paint, sold by Boyd & Moore............356 Market St., S. F.
BAY STATE BRICK AND CEMENT COATING—Made by Wadsworth, Howland & Co. (Inc.). See adv. in this issue for Pacific Coast agents.
Adamant Cement, Brick and Plaster Coating. Made by Parker, Preston & Co., Inc. Pacific Coast Branch,
Central Building, Los Angeles

PAINTS, OILS, VARNISHES, ETC.
Paraffine Paint Co......38-40 First St., S. F.
Glidden Varnish Co...........Cleveland, Ohio
Standard Varnish Works, represented by
W. P. Fuller & Co..S. F. and Los Angeles

PAVING
Warren Construction Co.,
217 Beck Bldg., Portland, Ore.

PHOTOGRAPHY
F. M. Metzgar..........58 Market St., S. F.
P. C. Armitage...........82 Third St., S. F.
R. J. Waters Co.......717 Market St., S. F.
Pacific Photo & Art Co.,
Monadnock Bldg., S. F.

PLASTERERS
C. A. Marks......42 21st St., Portland, Or.
D. Ross Clarke......708 Pacific Bldg., S. F.
A. J. Houch & Son,
431 E. Harrison st., Portland, Ore.

PLUMBING
J. E. O'Mara.........447 Minna St., S. F.
Valente & Leveroni..1609 Powell St., S. F.
Silva Heating & Plumbing Co.,
140 First St., S. F.
Henry T. Maddern,
1169 Jefferson St., Oakland
Ahlbach & Mayer......75 Dorland St., S. F.
Alex. Coleman..........1705 Ellis St., S. F.
Robert Dalziel Jr. Co. 418 13th St., Oakland
Fox & Co..........209 Second St., Portland
M. L. Kline..........84 Front St., Portland
Taylor & Stanton......308 Pine St., Portland
Thos. E. Hulme.......275 Fifth St., Portland
The Gauld Co....9 North Front St., Portland
Ryan Bros.,
540 Williams Ave., Portland, Ore.

PLUMBING FIXTURES
Crane Company.First and Howard Sts., S. F.
Geo. H. Tay Co......617 Mission St., S. F.
Haines, Jones & Cadbury Co.,
846 Bryant St., S. F.

PUMPS, MACHINERY, ETC.
Simonds Machinery Co., 12 Natoma St., S. F.
California Hydraulic Eng. & Supply Co.,
523 Market St., S. F.

RAILROADS
Southern Pacific Co......Flood Bldg., S. F.
Corvallis & Eastern Ry.......Portland, Ore.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Lilley & Thurston Co....82 Second St., S. F.
McCormick-Henderson Co.,
Postal Telegraph Bldg., S. F.

ROOFING AND ROOFING MATERIALS
Paradux Roofing manufactured by
J. A. & W. Bird & Co.
W. P. Fuller & Co., Pacific Coast Agents
Pioneer Roll Paper Co..........Los Angeles
Mackenzie Roof Co.,
425 Fifteenth St., Oakland
The Watson Roof Co.,
French Bank Bldg., 110 Sutter St., S. F.
Western Builders' Supply Co.,
680 Mission St., S. F.
H. D. Samuel Company, 23 Valencia St., S. F.
Metropolis Bank Bldg., S. F.
W. H. Wilson & Co., 42 Natoma St., S. F.
Olympic Roofing Co., Red Diamond Brand,
420 Sweetland Bldg., Portland
Ford & Malott,
Mariposa and Iowa Sts., S. F.

RUBBER TILING
Goodyear Rubber Co., 587 Market St., S. F.
61 Fourth St., Portland

SANITARY SPECIALTIES
D. H. Gulick..............Lick Bldg., S. F.

SASH CORD
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines......88 Broad St., Boston, Mass.

SCHOOL FURNITURE AND SUPPLIES
Spencer Desk Co....Monadnock Bldg., S. F.
C. F. Weber & Co......365 Market St., S. F.
210 N. Main St., Los Angeles

SHEET METAL WORK
W. Heidt Cornice Works..152 First St., S. F.
Yager Sheet Metal Work,
1006 Seventh St., Oakland
Chas. S. Amsler........25 Shotwell St., S. F.

SHINGLE STAINS
Waterproof and Odorless Art in Shingle Stains.—Made by Parker, Preston & Co., Inc. Pacific Coast Branch,
Central Building, Los Angeles

SLATERS' CEMENT
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SPANISH TILE
Meurer Bros.......Builders' Exchange, S. F.
San Francisco Metal Stamping Co.,
296 Eleventh St., S. F.

STABLE STALLS AND FIXTURES
Howe Scale Co..........143 Main St., S. F.

STAMPED SHEET METAL ORNAMENTS
San Francisco Metal Stamping & Corrugating Co., 296 Eleventh St., S. F.

STANDARD SCALES
George A. Riggs, rep. The Howe Scale Co.................143-149 Main St., S. F.

STEEL BARS FOR CONCRETE REINFORCEMENT
Jno. B. Leonard........Sheldon Bldg., S. F.
Woods & Huddart....356 Market St., S. F.
Tayler & Spotswood Co.,
Minnesota and 19th Sts., S. F.

STEEL ERECTING
C. A. Blume ......185 Stevenson St.; S. F.
G. J. Anderson..........503 Grove St., S. F.

STEEL MOULDINGS FOR STORE FRONTS
J. G. Braun, 537 W. 35th St., N. Y., and
322 S. Paulina St., Chicago

STEEL STUDDING AND LATH
Lilley & Thurston.......82 Second St., S. F.

STREET PAVING
Denny-Renton Clay and Coal Co,
Lowman Building, Seattle
Los Angeles Pressed Brick Co.,
Frost Building, Los Angeles
Warren Construction Co.,
217 Beck Bldg., Portland, Ore.

STEEL AND IRON—STRUCTURAL
Boyd & Moore........356 Market St., S. F.
Pennsylvania Steel Co., Chronicle Bldg., S. F.
Brode & Clark Iron Works.
621 Howard St., S. F.
City Iron Works....303 Front St., Portland
Woods & Huddart......356 Market St., S. F.
Northwest Bridge Works......Portland, Ore.

STEEL AND IRON—STRUCTURAL
Pacific Rolling Mills,
17th and Mississippi Sts., S. F.
Western Iron Works......125 Beale St., S. F.
Tayler & Spotswood Co.,
Minnesota and 19th Sts., S. F.
Boyd & Moore.........356 Market St., S. F
Brode Iron Works....621 Howard St., S. F.
Vulcan Iron Works....604 Mission St., S. F.
Golden Gate Structural & Ornamental Iron Works ....1435 Mission St., S. F.

STORE SERVICE EQUIPMENT
Lamson Consolidated Store Service Co.,
1403 Call Bldg., S. F.

STRUCTURAL STEEL CONTRACTORS
Mortensen Construction Co.,
19th and Indiana Sts., S. F.
Pacific Rolling Mill Company,
17th and Mississippi Sts., S. F.

TANKS
Pacific Tank Company..318 Market St., S. F

THEATER CURTAINS
Elevator Supply & Repair Co.,
593 Market St., S. F.

TILE, MOSAIC, MANTELS, ETC.
Hartford Faience Company, represented by C. F. Pratt.........660 Market St., S. F.
Mangrum & Otter....561 Mission St., S. F.
Oregon Art Tile Co., 311 Stark St., Portland
W. W. Montague, 557-563 Market St., S. F.

VACUUM CLEANERS
S. F. Compressed Air Cleaning Co.,
24 Montgomery St., S. F.
Mechanical Dust Suction Company,
301 Merchants' Exchange, S. F.
Vacuum Engineering Company,
772 Monadnock, Bldg., S. F

VALVE PACKING
"Palmetto Twist," sold by H. N. Cook Belting Co..........317 Howard St., S. F.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
McCormick-Henderson Co.,
Postal Telegraph Bldg., S. F.
Williams & Carter......197 Jessie St., S. F.

VENEERS
Dieckmann Hardwood Co.,
Welch Bldg., 244 California St., S. F.

WATERPROOFING FOR CONCRETE, ETC.
The Building Material Co., Inc.,
587 Monadnock Bldg., S. F.
Aquabar Co................Philadelphia, Pa.
Winslow's Hydraulic Coating, sold by Willkomm Building Supply Co.,
151 Tehama St., S. F.

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Dean Reversible Window Co.,
551 Brannan St., S. F.
Hausmann's Sash Carrier sold by Waterhouse & Price........59 Third St., S. F.
Hipolito Screen & Sash Co.,
634 Maple Ave., Los Angeles
Tabor Sash Fixture Co., Boyd & Moore Agents ....356 Market St., S. F.

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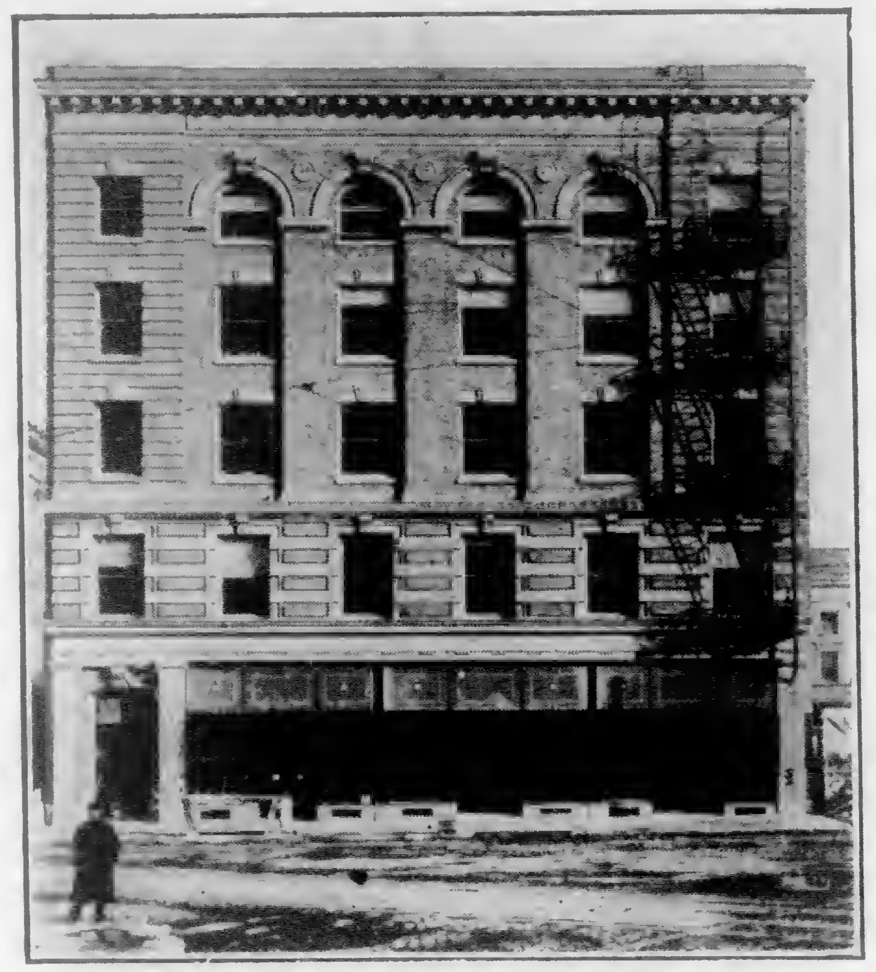
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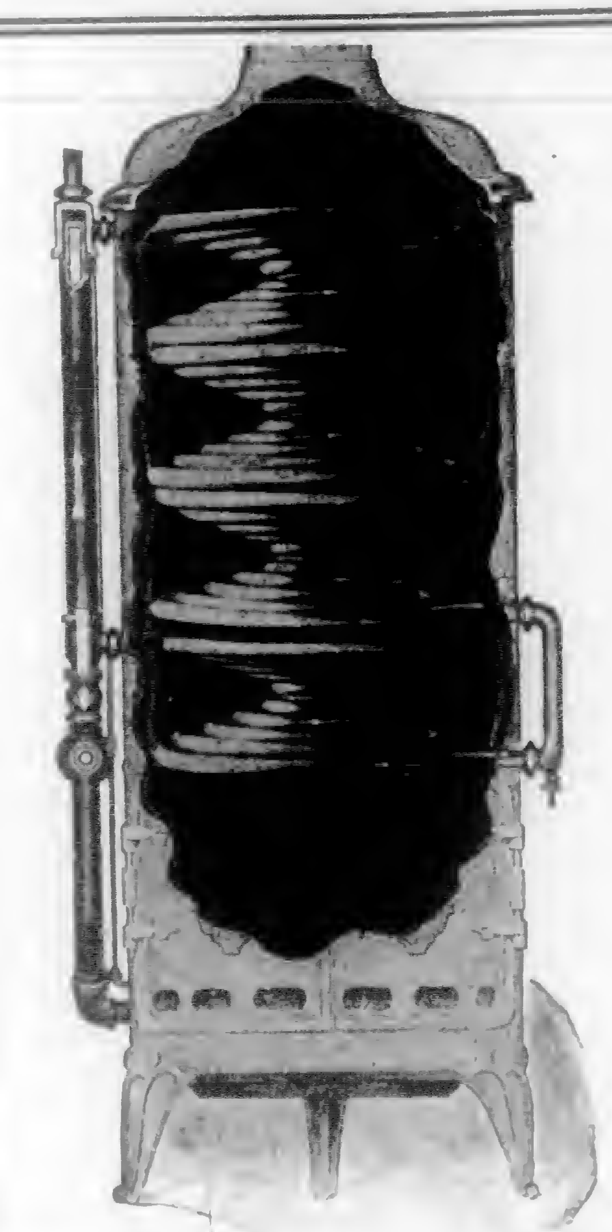
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- DENTAL PLASTER
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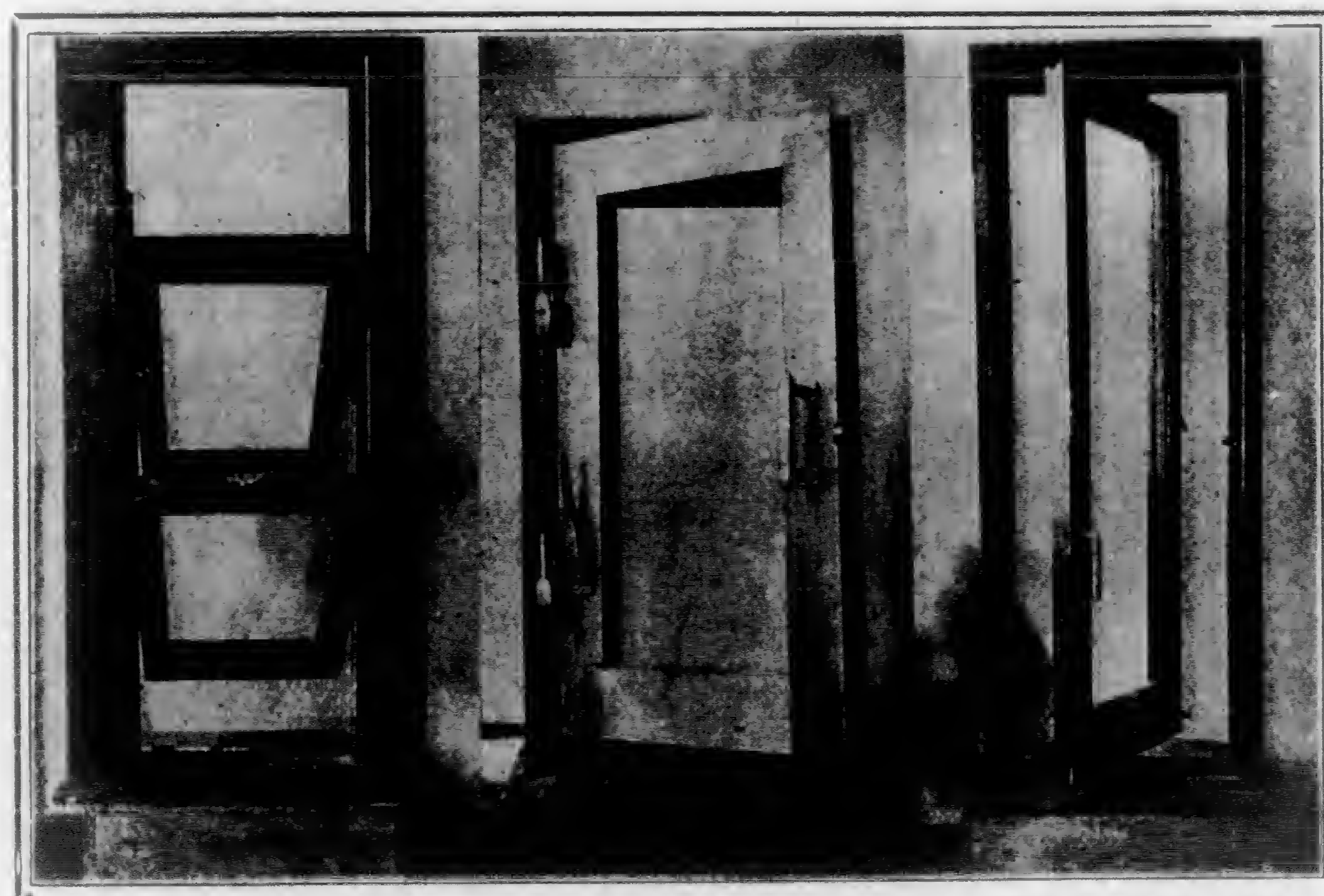
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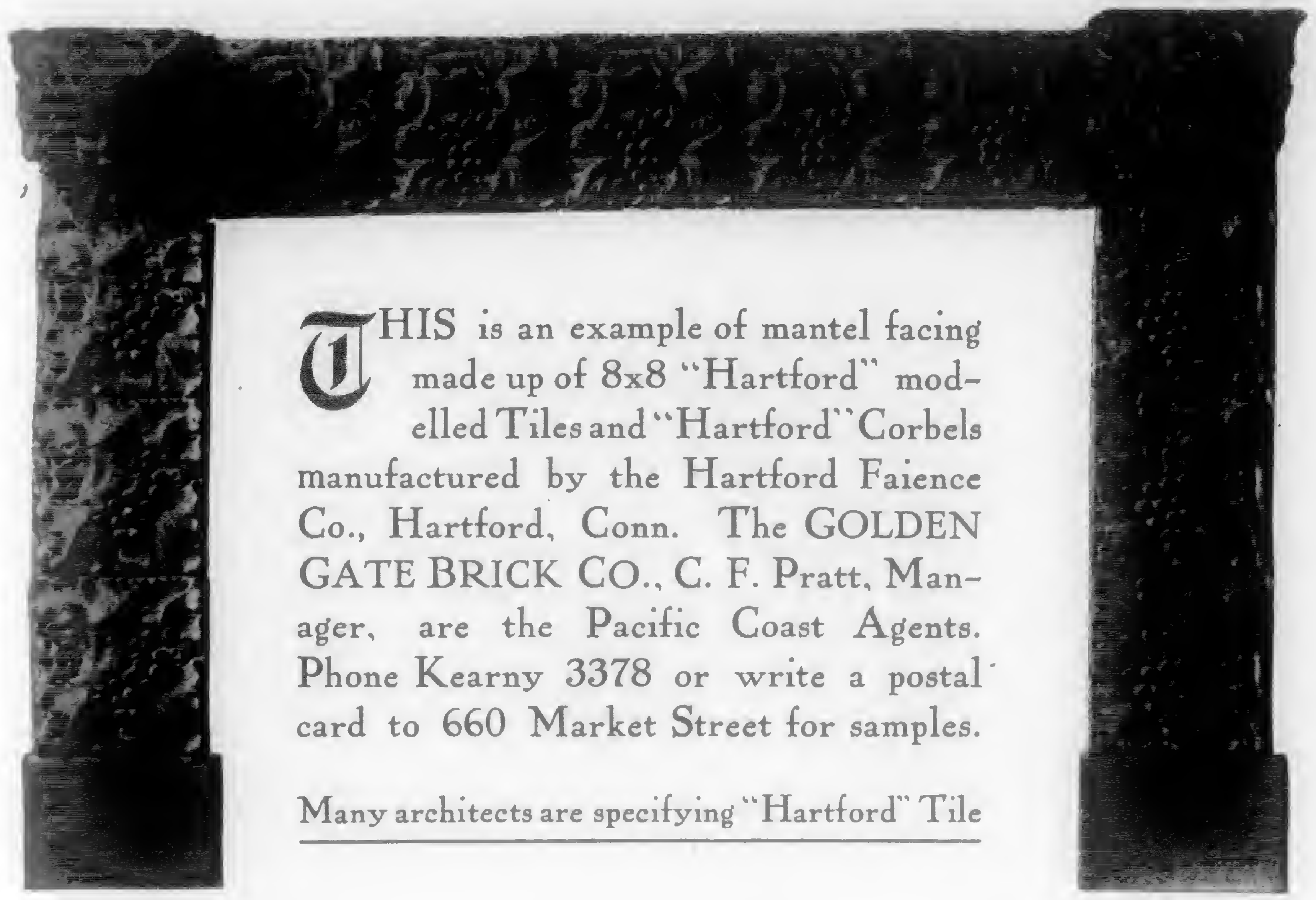
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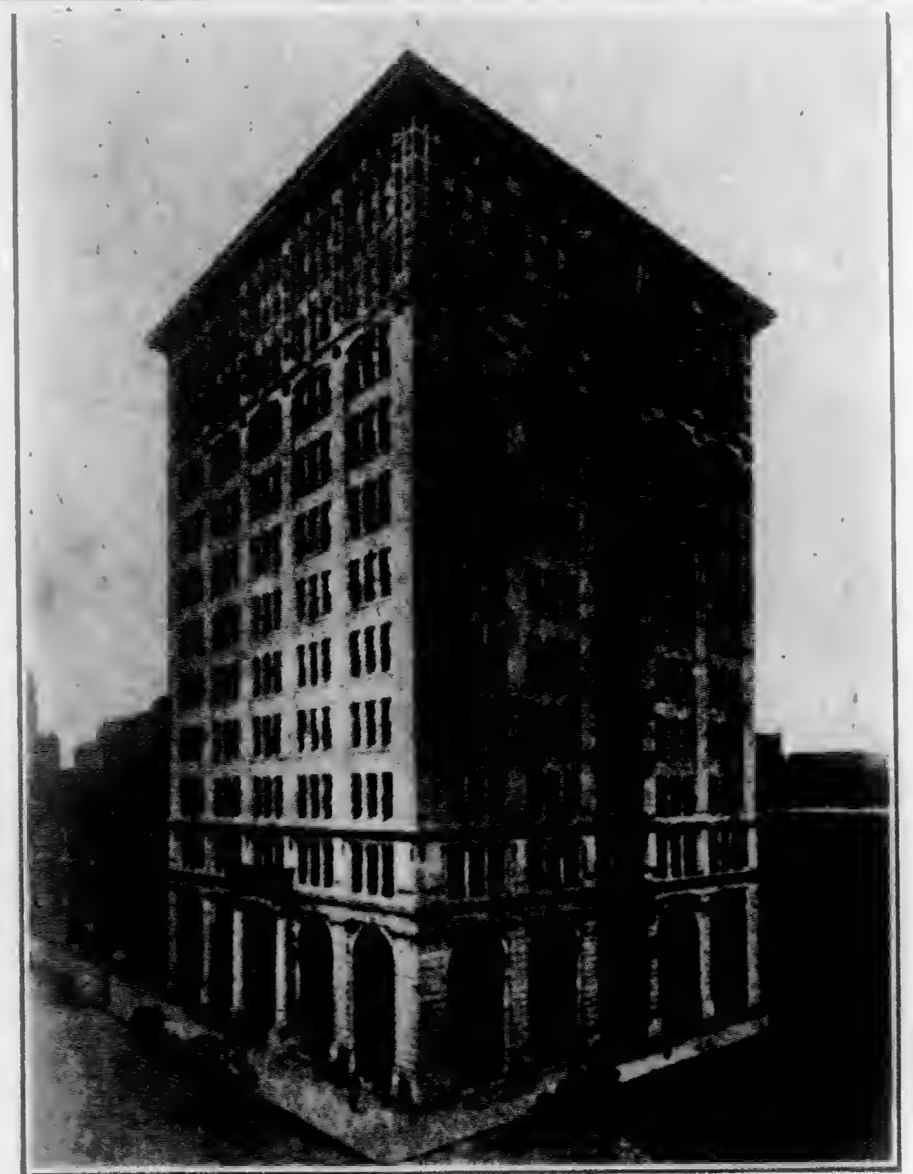
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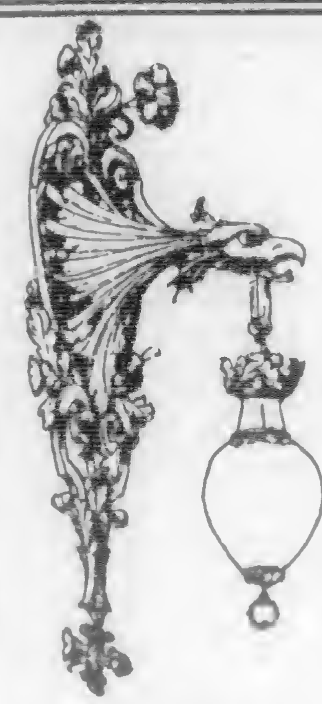
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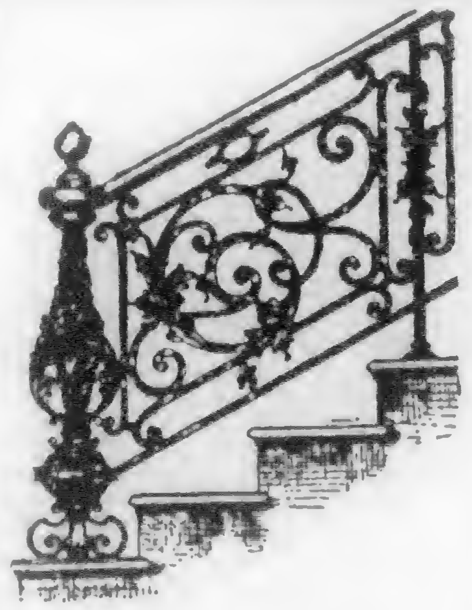


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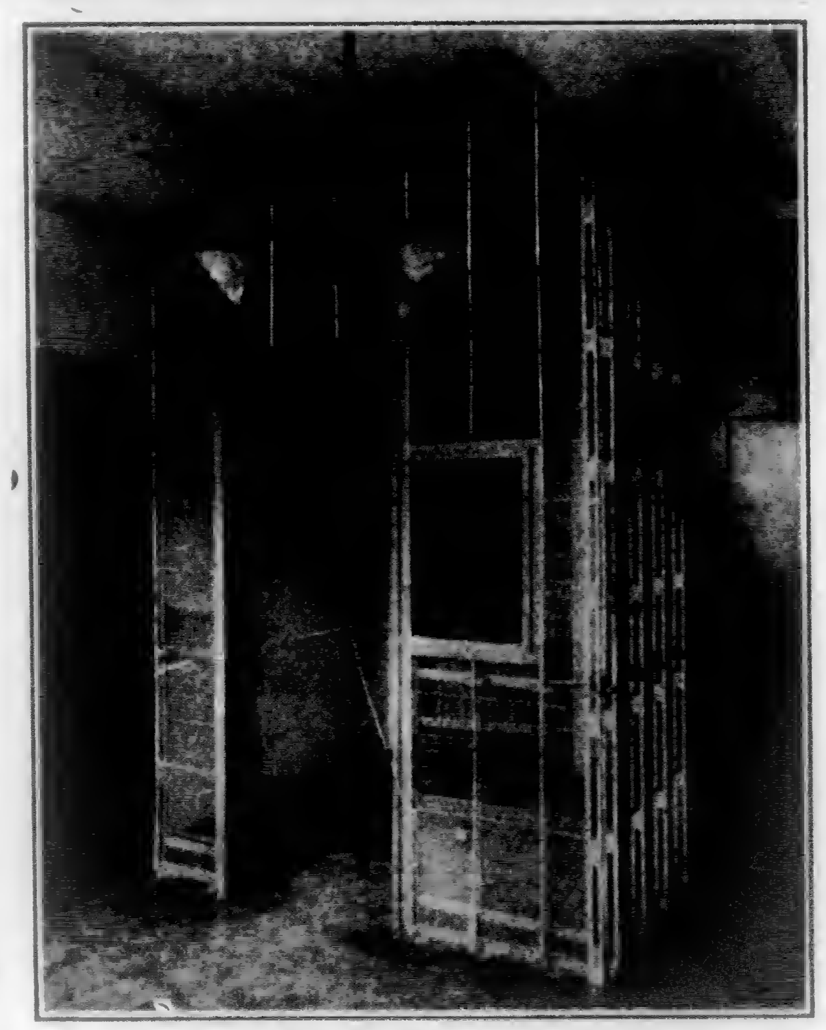
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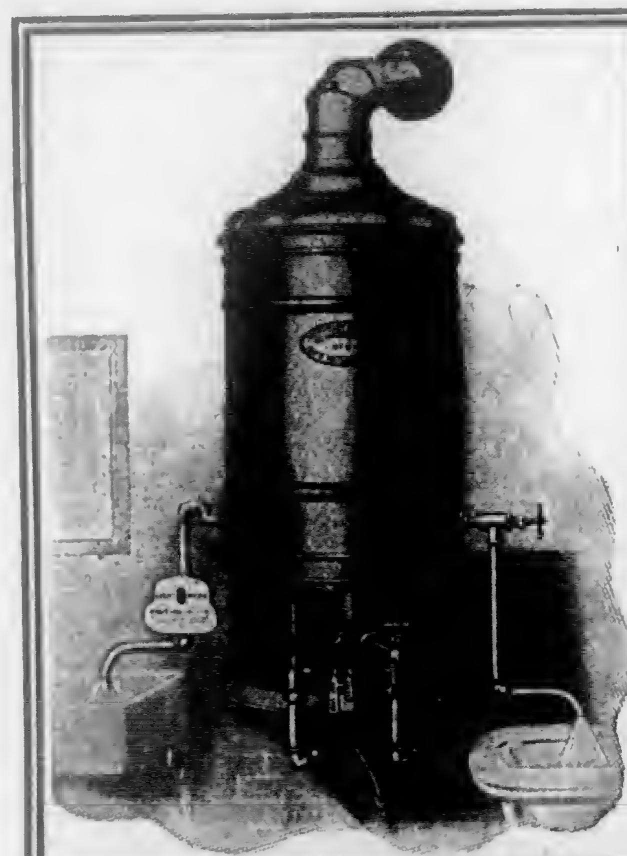
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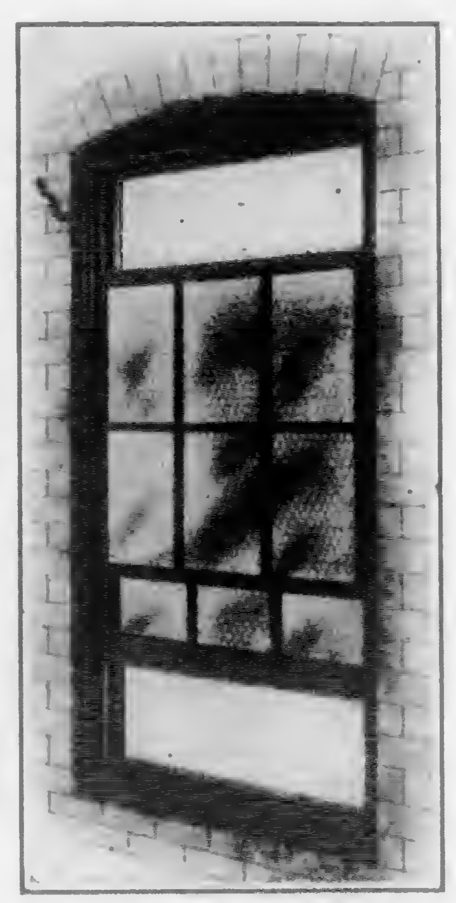
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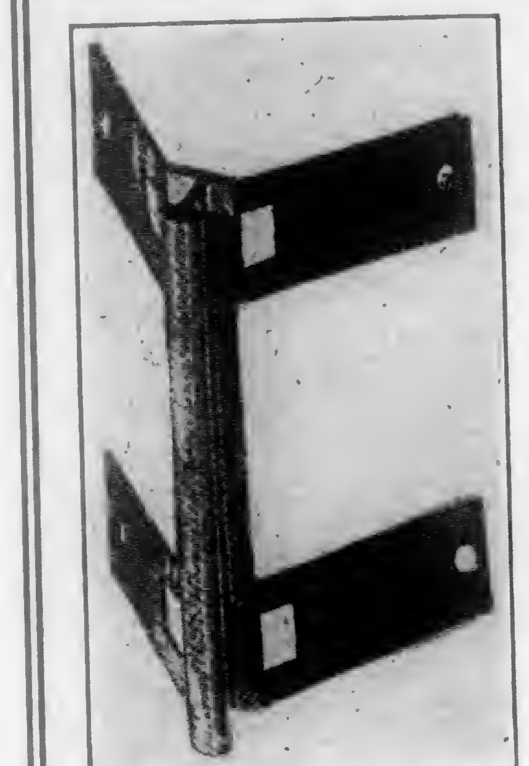
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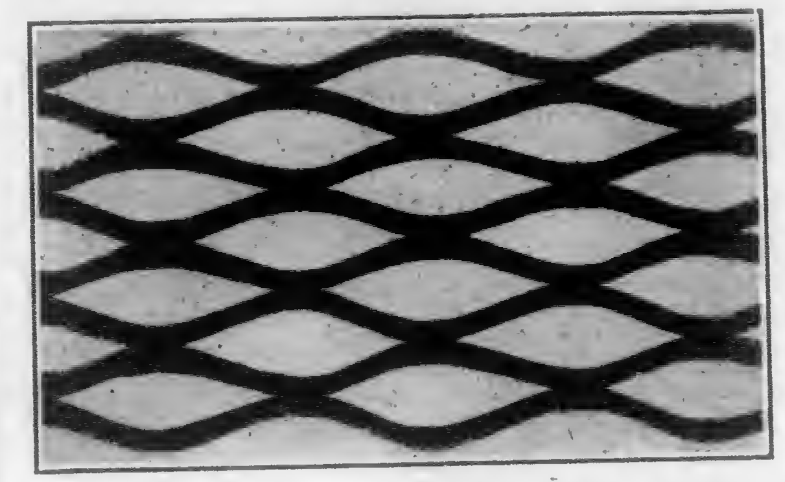
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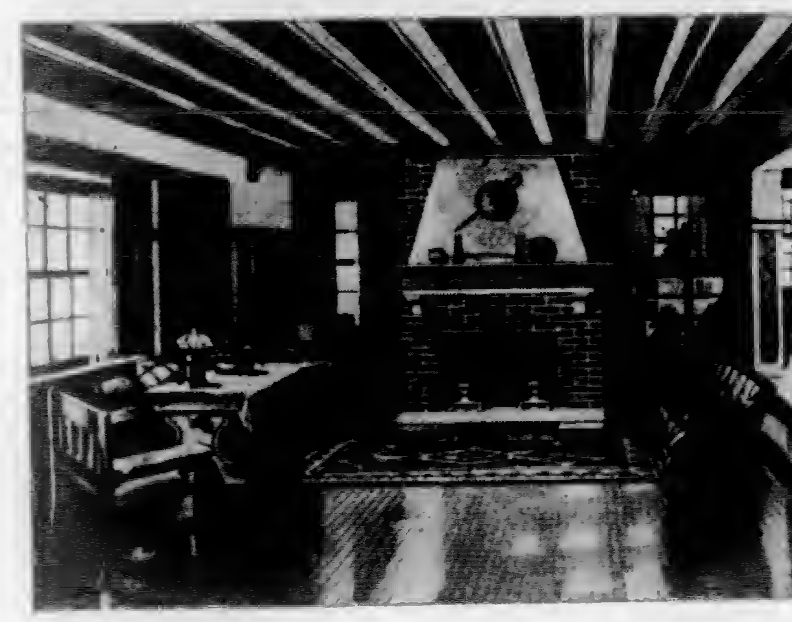
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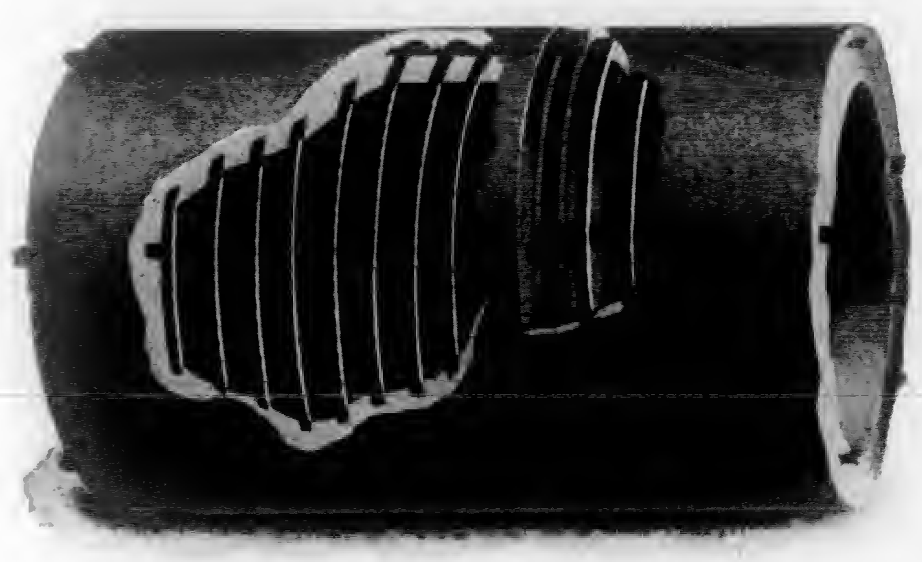
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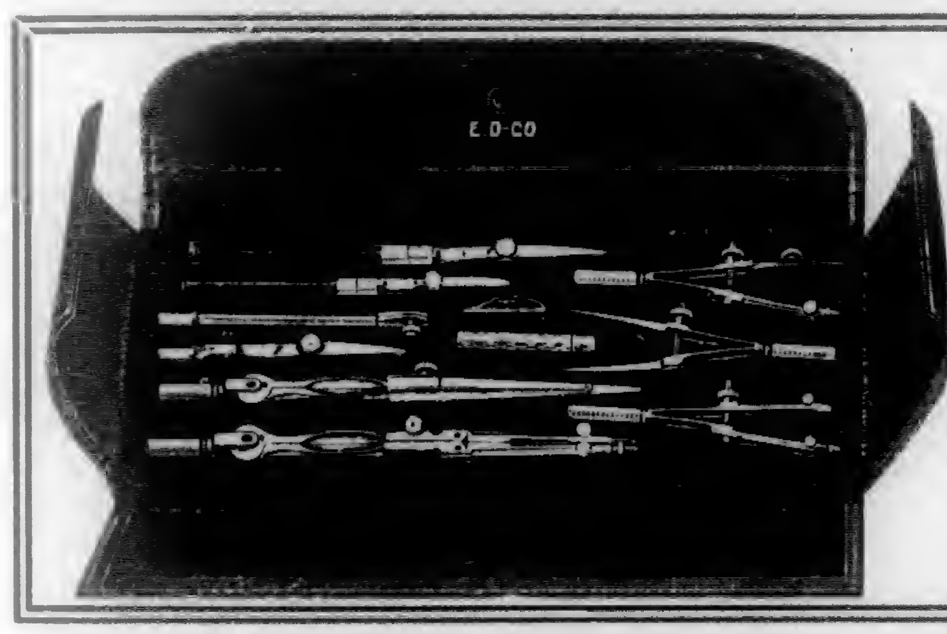
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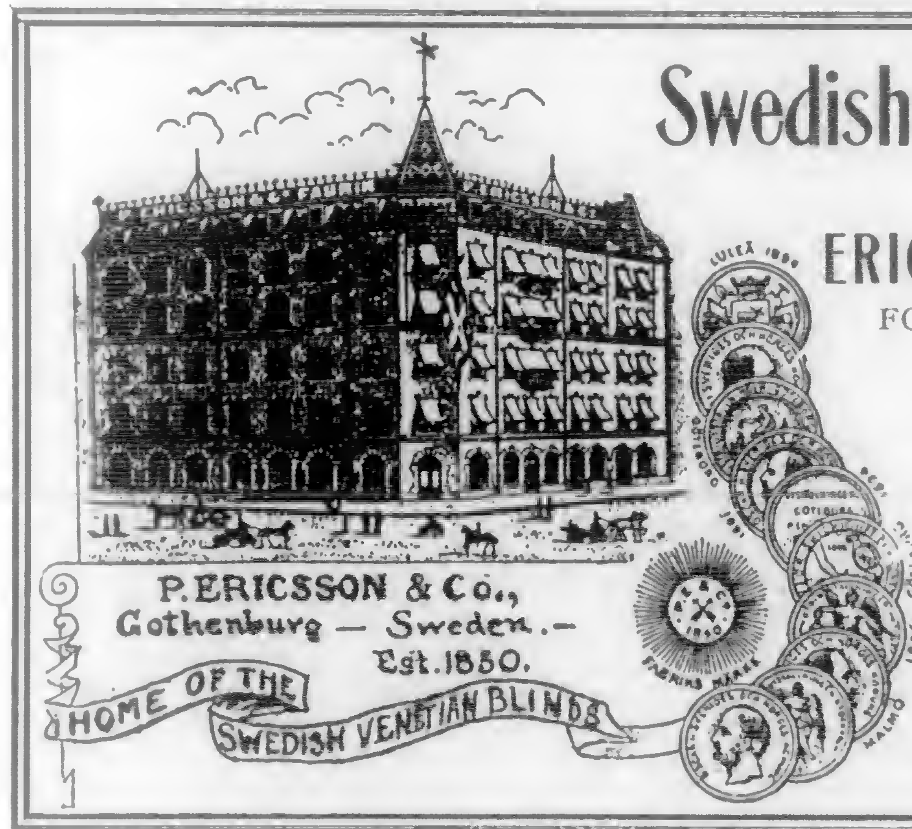
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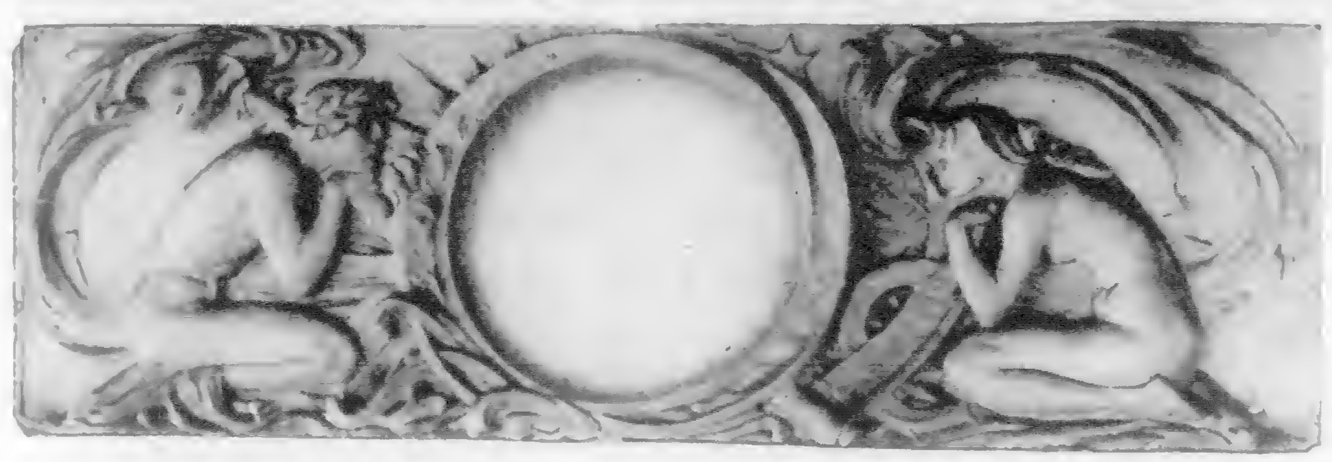
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Contents for November



MR. ALFRED F. ROSENHEIM
President 1909-10 the Architectural League of the Pacific Coast

Frontispiece.
The Architect and Engineer of California
November, 1909

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XIX. NOVEMBER, 1909. No. 1.

Coast League Should Adopt Policy of the American Institute

By ALFRED F. ROSENHEIM, President A. L. P. C.

IN THE conduct of the Architectural League of the Pacific Coast, of which I have been elected president, our policy should be identical with the policy of the American Institute of Architects, and we must act in unison and harmony with it, that its scope and usefulness may become truly national instead of nominally so.

I believe the Institute is at last coming to a realization of the necessity of holding its conventions alternately in each of the four sections of the country, and will, I am sure, very soon honor the Pacific Coast with the first meeting in its history.

If the Western chapters can manage to send comparatively large delegations to the East, certainly the Eastern chapters, having larger membership and larger means, should be able to do proportionately better with respect to the West.

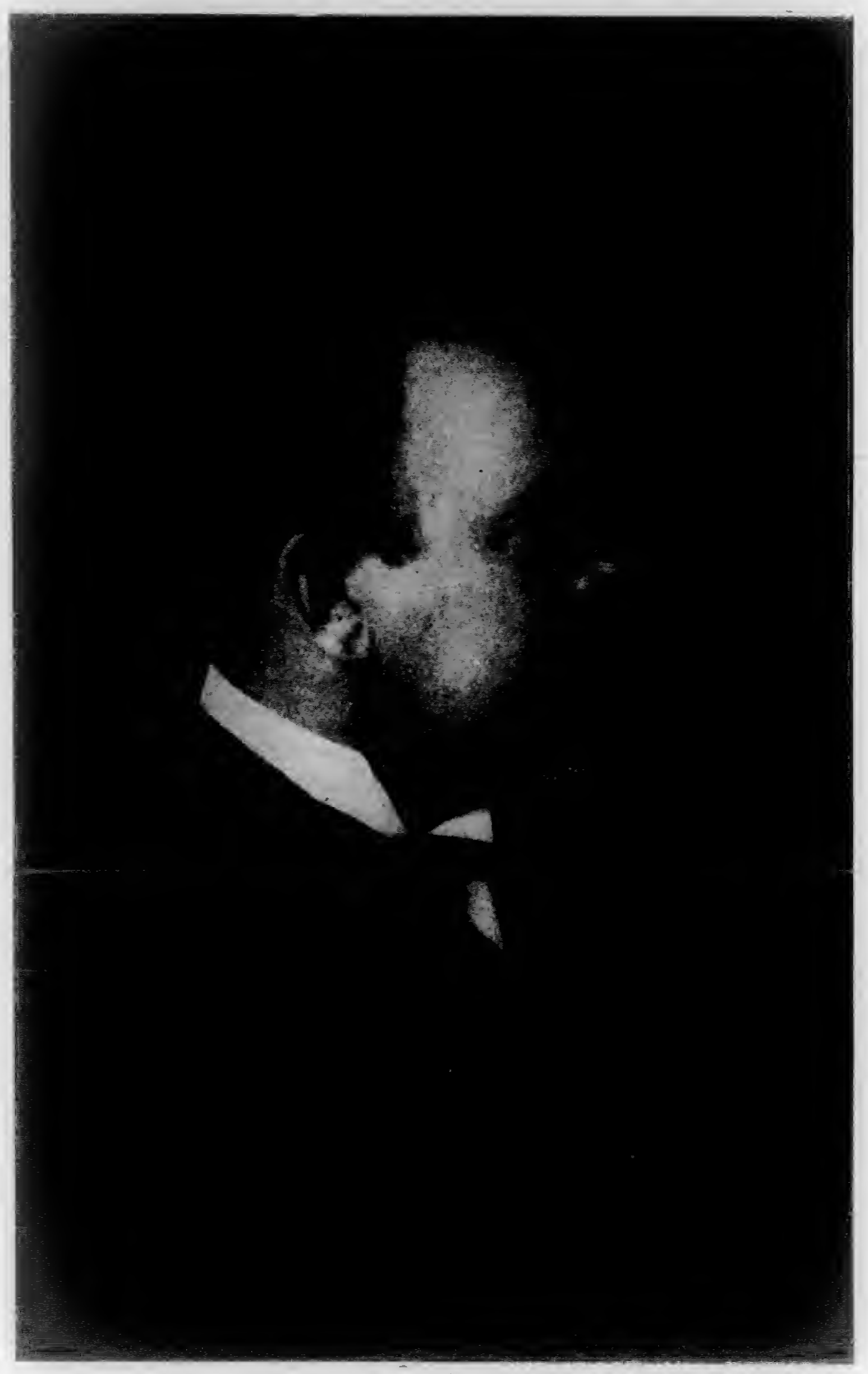
As representation in the conventions is directly dependent on the number of Institute members, either Fellows or Associates, in the several chapters, it is highly important that chapters increase their Institute membership as rapidly as possible, so as to give them a larger share in the ministration its affairs.

This leads me to suggest that every member of the Coast League should consider it his duty to submit an application for admission to the Institute's ranks at once.

First Annual Convention of the Architectural League of the Pacific Coast

THE first annual convention of the Architectural League of the Pacific Coast was held in San Francisco October 18th to October 20th. Delegates were present from Seattle, Portland, Los Angeles and other Coast cities and much enthusiasm was manifested. Mr. Cass Gilbert, president of the American Institute of Architects, and Mr. Irving K. Pond, vice-president of the same organization, were among the guests of honor. The opening session was held in the Monadnock building. In the absence of the Mayor of San Francisco, Hon. James D. Phelan delivered the address of welcome. He said in part:

"I bid the visiting architects welcome to an entirely new city—a city erected on the same ground that the old one occupied. After the disaster we were practically only a townsite, but a very excellent townsite; only a townsite because the disaster in its completeness left nothing to be desired in the way of destruction. All the principal architectural piles in the city were destroyed, and we have witnessed during the past three years a most successful development. We who have been very close to it cannot fail



MR. ALFRED F. ROSENHEIM
President 1909-10 the Architectural League of the Pacific Coast

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Coast League Should Adopt Policy of the American Institute

By ALFRED F. ROSENHEIM, President A. L. P. C.

IN THE conduct of the Architectural League of the Pacific Coast, of which I have been elected president, our policy should be identical with the policy of the American Institute of Architects, and we must act in unison and harmony with it, that its scope and usefulness may become truly national instead of nominally so.

I believe the Institute is at last coming to a realization of the necessity of holding its conventions alternately in each of the four sections of the country, and will, I am sure, very soon honor the Pacific Coast with the first meeting in its history.

If the Western chapters can manage to send comparatively large delegations to the East, certainly the Eastern chapters, having larger membership and larger means, should be able to do proportionately better with respect to the West.

As representation in the conventions is directly dependent on the number of Institute members, either Fellows or Associates, in the several chapters, it is highly important that chapters increase their Institute membership as rapidly as possible, so as to give them a larger share in the ministration its affairs.

This leads me to suggest that every member of the Coast League should consider it his duty to submit an application for admission to the Institute's ranks at once.

First Annual Convention of the Architectural League of the Pacific Coast

THE first annual convention of the Architectural League of the Pacific Coast was held in San Francisco October 18th to October 20th. Delegates were present from Seattle, Portland, Los Angeles and other Coast cities and much enthusiasm was manifested. Mr. Cass Gilbert, president of the American Institute of Architects, and Mr. Irving K. Pond, vice-president of the same organization, were among the guests of honor. The opening session was held in the Monadnock building. In the absence of the Mayor of San Francisco, Hon. James D. Phelan delivered the address of welcome. He said in part:

"I bid the visiting architects welcome to an entirely new city—a city erected on the same ground that the old one occupied. After the disaster we were practically only a townsite, but a very excellent townsite; only a townsite because the disaster in its completeness left nothing to be desired in the way of destruction. All the principal architectural piles in the city were destroyed, and we have witnessed during the past three years a most successful development. We who have been very close to it cannot fail

to appreciate what has been accomplished by the architects and builders in San Francisco during the past three years, and hence it is fitting that the Architectural League should meet in San Francisco at this time.

"The old San Francisco represented a growth of about sixty years, and in its composition represented all types of architecture and all classes of construction, good and bad; but since the fire we have only good construction for the most part.

"Of course, the exigencies of financial conditions sometimes limit well-meaning citizens in their expenditure to a class of building which is not according to the plans of the best architectural form, and we can only have commiseration for those people. We cannot blame them, but even a cheap building can be made comely, and I am glad to see that our architects have been making a durable city that is not built upon a rock.

"Regarding San Francisco as a townsite, it may be interesting to you strangers to know that in the early days it was not regarded as a favorable location, and men who were wise in their own departments—such men as General Sherman—believing that the city on the Bay of San Francisco would be constructed at the confluence of our great rivers, the San Joaquin and the Sacramento, which meet the bay near the city of Benicia, and they made investments there in town lots; and General Sherman in his memoir says that it was a most surprising and unexpected thing that the town should grow upon the townsite of Yerba Buena, as the only means of communication with the interior States was by means of rivers at that time, and he could not see why San Francisco should exist at all—that the city was a mistake. Benicia at that time was a townsite and designated by the name of Francesca, which was the baptismal name of the woman whose husband presented the townsite to the founder, and the people of San Francisco changed the name from Yerba Buena to San Francisco, giving the town the same name as the bay. The people of Francesca protested that San Francisco was too near the name of Francesca, and they were obliged to change their name to Benicia.

"In 1906 when the Spring Valley Water Works broke down, largely because the board of directors failed to act upon the advice of their engineer, Mr. Schussler, who advised the directors to strengthen the system, especially where the main feeding pipes were over marshy lands, the city was destroyed by fire; and now we are installing an auxiliary water system where in times of great stress we can draw upon the waters of the bay, so that now we are powerful to meet fire. Our buildings were not destroyed by earthquake, except those which were of flimsy construction upon very poor foundations."

In conclusion Mr. Phelan spoke of the work that had been done toward establishing a civic center and encouraging the "city beautiful idea." He said:

"The future of the beauty of San Francisco is yours. You are the high priests of architecture, and it devolves upon you to direct the public in the work which would result in their mutual benefit. You are the priests at the altar of beauty. If you can elevate the minds of the people to mutual benefit in that sentiment which is true, then everything will be easy. The city as a community will progress in lines of business and beauty; the citizens in erecting their houses or their places of business might pause for the sake of beauty, if we could elevate all men in that line. If the city is more prosperous and the business house is more prosperous, the business man will be more ready to receive the beautiful. Teach him the art of beauty, and he will get it."

President Willis Polk occupied the chair and made a few explanatory remarks in regard to the mission of the League. He said:

"The purpose of this meeting, as pointed out by Mr. August G. Headman, is primarily to take the draughtsmen who are compelled to work for the hard-hearted architects and to go to them as much as possible, and to point out to them the principles of success—not only in design, but in his integrity; not only in construction, but in decoration, and in all the many things that comprise the successful practice of the profession of architecture; and not only are we doing them a favor, but we are honoring ourselves and bestowing a gift of prosperity. Now, it is the definite purpose of this organization to try and accomplish that end. It will not be easy to do so. It will be very hard indeed to reach the young man, because, first, most of the young men themselves will be indifferent. They could not possibly have any comprehension of the value to them in the future of the study of these things at the present. It is not in the nature of young men to have comprehensive minds. Their minds are undeveloped. On the other hand, it will be very hard to do anything for them on our account, because we will be too busy and will not have time to devote to it. The problem is exceedingly difficult. It is the difficult problems that ought to be interesting and are interesting to men. Therefore, greater energy will be applied to solve the problem.

"The next and one of the most important purposes of this meeting," said the speaker, "is to try and reach the outside public. The public at large only possesses and could only possess a superficial knowledge and interest in architecture. The business man who is going to build a building does not look for an architect so much as he does for a successful business man, no matter how large the building may be; the men in control are in control of their destinies. If, incidentally, they can get an architectural touch on their buildings, they are satisfied. They are always ready to go along the street and say, 'That is a fine building', but when it comes to building their own building they are satisfied to say that it is well constructed."

Brief addresses were made by President Cass Gilbert, Louis C. Mullgardt and others. The remainder of the morning session was taken up with the appointment of committees, etc.

Second Day's Session.

The second day's session of the Convention of the Architectural League of the Pacific Coast opened at the Greek Theater, Berkeley, on Wednesday, October 20th, at 11 A. M.

Mr. Willis Polk acted as chairman and made the following introductory remarks:

"We have you here this morning for the final session of the Architectural League of the Pacific Coast. It is perhaps appropriate that a meeting of architects should be held in this, the Greek Theater of the University of California. It is not necessary to tell you gentlemen that we are sitting almost among the same surroundings, under the same beautiful heavens and amid the same ether and design as has always been the highest inspiration to architects; it is the air of simplicity which constitutes the highest expression in architecture, and it is here expressed in the very finest degree. This building was dedicated for the uses of the public, under auspices most favorable to the occasion, by the head of the University; he is not with us to-day, but we have, in the absence of the president, Professor

Benjamin Ide Wheeler, his representative, Mr. Lange, whom I now present to you."

Mr. Lange: "Gentlemen of the Architectural League of the Pacific Coast: We of the University of California are supposed to practice the fine and useful art of education, and you of the Architectural League practice the fine and useful art of architecture. You and we have the same bedrock purpose in view—that is, to embody beautiful ideas in endurable forms. There is one bond of union now in carrying out our common purpose: we of the University are trying to build up the love of education on this Coast and throughout the country, so we must needs be not only teachers, but education architects; but in constructing the large part of the environment, you must not only be architects, but also educators, whose work is linked with ours and encourages a common service and acts as a warning to others. I often think how architecture and education should be made to flourish together. If so, every school on the Pacific Coast could be made a thing of beauty and a joy forever. Our children could be taught these beautiful ideals imparted by art and inculcate them into our private dwellings and public buildings and thus live on a higher plane because of the architectural glory which surrounds us—although the teachers sometimes find that the noise on the campus is deafening and the voice of Mr. Howard is supreme. In this new land, this new civilization, it is our endeavor to find in architecture and education the forms that will best express the character and spirit of our American Pacific Coast. Now, gentlemen, I am sorry not to be able to tell you more at this time. I bid you all a cordial welcome, and you should not find it difficult to feel at home."

Professor Bernard Moses.

Professor Bernard Moses, a member of the Faculty of the University of California, was next introduced. He said:

"It is a great pleasure, Mr. President, for me to be counted in, even temporarily, with you gentlemen who do things, whose business it is to erect landmarks of our country, whose business it is to build the national monuments, the monuments which will stand when a good many other things of the national life have passed away. It is your business to build so that the things which you construct will be, like this place, the goal of pilgrimages, for this theater, constructed by one of your number, has become a kind of object lesson for children; they come here from all parts of the world, and they come by the tens of thousands. We, who utter words, have our day; like the wind, we blow about the campus here; but our deeds are like the silence that comes after the wind. You have the better end of the undertaking; your work lasts very much longer. We sometimes in our serious moments write books, but these are but temporary records. The oldest records are the works of architects.

"It was my good fortune some time ago to visit Narcius and to observe some of the results of the excavations that had been made at that once celebrated center. There was a good deal to learn there in that ancient city that existed two thousand years before the Christian era. We found there plenty of writings; they were in clay; they were bounteous; there were bushels of them—but no one could read them. Books were there, but the language was unknown; but we could read from the architectural remains, from the foundations of the buildings, from the stairways that still remained; through these we could read very much of the life of the men and women who occupied that place. Architectural undertakings are the best examples we have of definite ideas; they are the most persistent efforts, those efforts that are seeking to realize some definite architectural



Detail of California Building, Alaska-Yukon-Pacific Exposition
Valere de Mari, Designer

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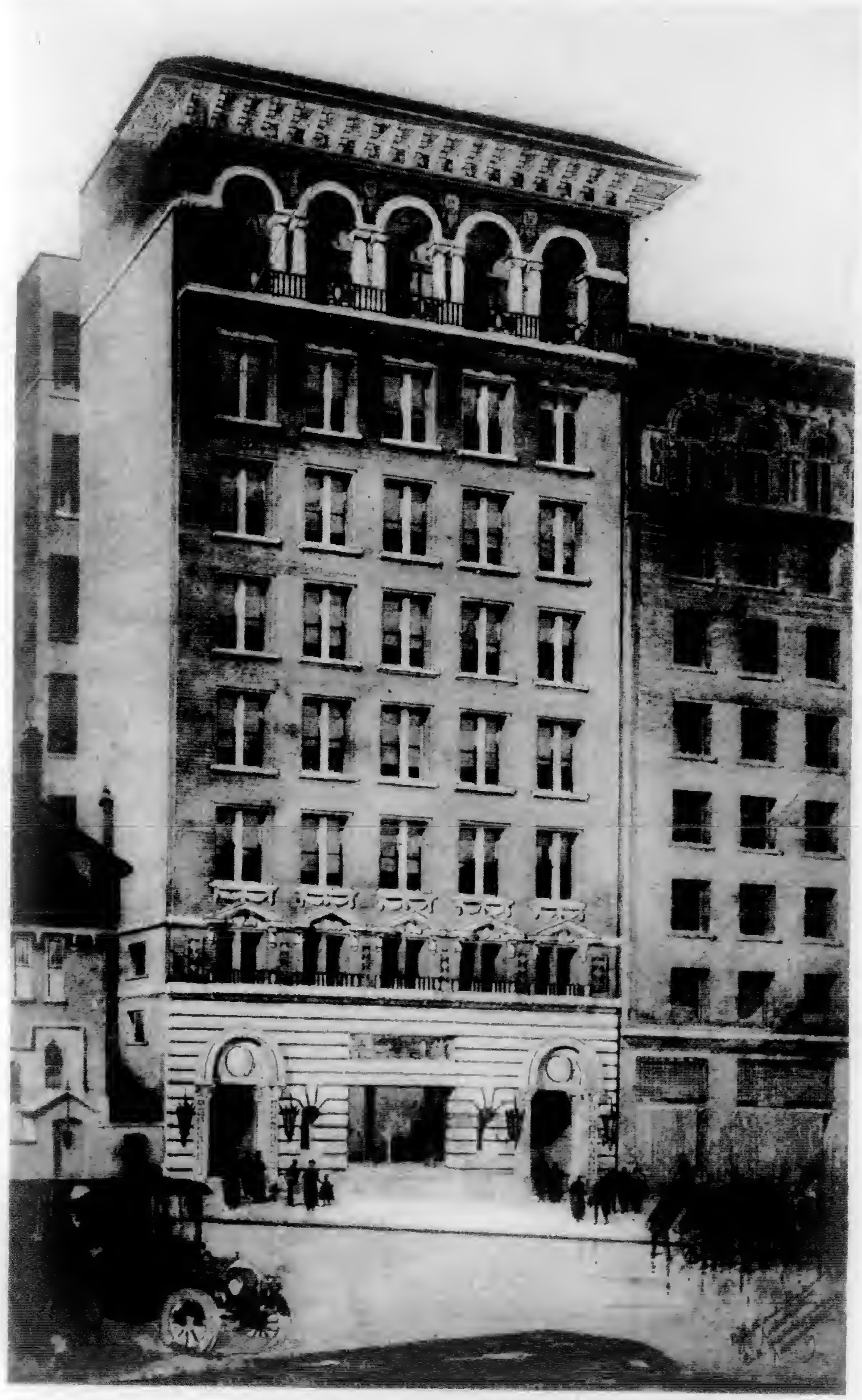
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Valere de Mari, Designer



Native Sons Building, San Francisco

Righetti & Headman, Architects E. H. Hildebrand, Associate



White Investment Company Building, San Francisco

Louis P. Hobart, Architect

end. Some of you have probably gone by the great cathedrals in Spain and remember the work of the stone cutters. Men have worked there for four hundred years in attempting to carry out the vast ideas and plans. It is a peculiar task of the architects in this country to cultivate the taste of the American people. It is your peculiar task because your works are seen by more persons than the works of any other artist. Your work is out of doors largely, and we are out of doors.

"On the architects rests a peculiar responsibility in attempting to cultivate and bring back taste in the American people. I say everything back has been lost very largely for this reason: when we left the older part of the world we left practically everything connected with it. We left behind us the political system and the social system of the old world; we cut ourselves off from everything connected with it. The people who came to New England brought none of the old traditions. They developed special ideas that seemed to them all-important. That was the ethical idea, and so much stress did they lay on this ethical idea that they forgot most of the other ideas. They forgot the ideas of beauty, and in this respect they stand in contrast with our neighbors, the Latin-American people, who came from Spain with all the traditions of Spain respecting culture and beauty. They brought that portion of artistic form which our ancestors left on the way. This feature, you will observe, is especially prominent. That is the portion of the beautiful things in architecture that our ancestors built under the impression of their ideas.

"Take, for example, the little church in New England. It was adapted to the economical conditions of the people of New England. It was not a beautiful thing, if beauty was regarded as desirous. It appealed to the senses. Under that idea, we sacrificed a great deal, losing all the instincts. Our friends in the South came with very different ideas; their ideas were full of beauty. Moreover, our houses were not things of beauty—very comfortable, but not things of beauty, whereas there are very few structures that have some beautiful features of the old Spanish-American houses. Those houses appealed to them—the sentiments they brought with them. In this respect we have very much to do in order to catch up with the procession. We have fallen behind because our ideas of beauty were starved through our ethical pro-religious ideas of New England.

Inherit Spanish Tradition.

Now, there is certain pride in this part of the country. Californians brag a good deal, but not as much as some people say we do. We sometimes say there is hope for the redemption of the race in California. A certain kind of art lives out of doors and must live out of doors. Music lives indoors, but music here can live out of doors. We have here, then, the climate under which art has flourished. We have the climate of southern Greece, of Italy and Spain, that is bound to have its effect in future. We may be able, through some of the influences, to redeem ourselves and to gather up, perhaps, what we have lost.

"Then we have here some of the Spanish tradition, having a little display of it over in the city just at the present time. We are trying to adapt ourselves to these conditions. At any rate, we have perhaps inherited here more of the Spanish tradition than in any other part of the country. We have kept it pretty well, not only here but throughout the country. The minds of men are being turned to the South and to the Latin-American traditions. The Latin-American people have greater respect for the forms of social life than we have. There is an opportunity for us of the United

States to be encouraged. What we have lost may be in some sense redeemed, and it depends on this convention and other conventions in the same profession to redeem our taste. Now, we have here, then, certain elements that are quite necessary for the improvement of the artistic sense of the American people.

"Here on this Coast it should be necessary that we should be influenced in an ethical sense. We should be forced to observe honesty. The trembling here of which we have a little bit once in a while encourages us to be honest in building, and then by reason of our attachment to Spanish tradition we have something of generosity to expect. Generosity and dignity will probably enter into the structures that are made in this country; that is because we have inherited somewhat from the dignity of the building of Rome and carried through the Latin-American tradition. This we may expect, and we rely upon you to make us depend on your expectations to have honest and dignified buildings. I am very glad, gentlemen, to have had this opportunity to be counted in with you."

Mr. Polk: "It is a matter of gratification and almost a matter of surprise to professional architects to find one of another profession whose sympathies and observations so keenly reach the tenderest chord that responds to an architect's pulsating heart. We have here to-day a great many earnest young men. We have here a few earnest middle-aged men and perhaps one, or perhaps more, earnest old men. It would perhaps be impossible to contradict a statement that such earnest old men were once earnest young men. It is only the earnest young man who is able to remain earnest in old age. The earnest young man is the hope of posterity and the reward of the earnest old man. All of the young men who are here to-day will be glad to hear from the old man that I know of, who, I remember, when I was young was a member of architects' clubs and dreamed that some day he would be at the head of the profession, or perhaps be honored by the highest office in the gift of the profession."

President Cass Gilbert.

With this picturesque but not entirely accurate introduction, Mr. Cass Gilbert, president of the American Institute of Architects, spoke as follows:

"Gentlemen, I heard the other day that there was a celebration at Dayton, Ohio, in honor of the invention of the flying machine. The city was decorated in red, blue, yellow and white. Country people came from miles around, and when the whole performance had been gone through the inventors of the flying machine were brought forward and were placed on the platform and asked to make a speech. They advanced to the front of the platform and said:

"'Gentlemen, I thank you.'

"Their speech was simple, but I do not think that I could have been persuaded to say that much. But in calling on me for a speech gives me the opportunity of declining the distinction which Mr. Polk has placed before you, the distinction of being an old man. Here is Irving Pond, old enough to be my grandfather. Mr. Howard was in the profession years before I was born. I decline the distinction, Mr. Polk; I am not old. Whatever your point of view might be, I am not an old young man nor a young old man. I have always considered myself as being in the class of young men, and I am going to still; but youth, with its aspirations, its dreams, its opportunities, the future it can make for itself, is, after all, the youth of the heart, whether old physically or young. When the man ceases to be young at heart he ceases to be a young man. Cato read Greek at

eighty; Socrates when at fourscore years was at his best. The time may come—some sixty years hence—when I should like to join that band, not here.

"I am seriously amazed; I am filled with amazement; it gives me the greatest pleasure to be in this place; I have often heard of it; it has never before been my fortune to be in a Greek Theater, excepting once, and that was in the Lyceum Theater, out of Florence. The impression that one gets here is marvelous; the very rudeness and picturesque design of this splendid amphitheater, with its spots of light on the other side, gives one an impression of the great extent of its architecture.

"I would come any distance to see such a splendid piece of work. Nothing has been left undone to make it complete. Perhaps people dressed in the costumes of early days would add something to the color. It is a beautiful monument and will be enjoyed by those who come after us, with which thought all heartily agree, but we have never put the ethical effect, or influence, upon architecture as combined with the ethnical effect—that is, the effect of races; Japan and Spain bringing their influence together with that of New England and creating a new Athens, a new Greece in its entirety, and all the beautiful country of Sicily and Southern Italy.

"I cannot imagine a place where there are greater opportunities for architectural development. The people are behind you; they want it; forget the Georgian architecture of New England; forget the Elizabethian style of England; forget it and adopt the precedent of the Southern latin countries like Spain and Italy. You have brought the Moresque, the Roman, but also include the glorious colors in which the Romans themselves were lacking, the influence of the Spaniards, who came here after that influence had been indelibly impressed. I know of no place where such architectural beauty can be created as here. I do not know how to thank you. I arose in a spirit of levity, but I now feel profound. This society on the Pacific Coast is a great forward movement and the work that you are doing must produce good results."

Mr. Polk: "It might be said that the Architectural League of the Pacific Coast, which was conceived by Mr. E. F. Lawrence, of Portland, Oregon, has not yet the distinction of being born; it is in process of formation; so far the Portland Architectural Club, the Washington State Chapter of the American Institute of Architects, the Seattle Architectural Club, the Southern California Chapter, the San Francisco Chapter of the American Institute of Architects, are its component parts. Each of these organizations has representatives here to-day and each is represented on committee appointed on Monday to formulate some line of work for the future. The successful continuance of this organization will be in the hands of the coming executive officers, who will be elected to-day. Its health, growth and full development will be in the hands of those that come after. In addition to the representatives of the societies on the Pacific Coast, besides Mr. Gilbert, of New York, we have an earnest gentleman with us to-day, possessed with an ambition which he has never been able to gratify; an earnest purpose, which has always lead him onward and upward; who perhaps holds dearest among his many ambitions those natural ones of worldly distinction, but unlike many ambitions that he may be able to gratify, there is one, and that is, he holds the highest office in the gift of his profession. I take pleasure in introducing a master of those useful ambitions, Mr. Irving K. Pond, of Chicago."

Irving K. Pond.

Mr. Pond: "Gentlemen, the program says an address by so and so, or by Mr. Burnham. I wish he was here; but the fact still remains that I am among friends and among brothers; but like one of the great Romans, I came not here to talk; I came to bring hearty greetings from our friends in the East to the friends across the plains. I came in on a delayed train; I came into Seattle five hours late and into San Francisco almost as late, but when I arrived and saw the gorgeous sight that was before me, I felt that the impulse of the occasion would cause the trains to bound and reach those points ahead of time instead of being delayed. As I brushed off the dust of the plains and washed the smoke of Chicago from my eyes, I felt that here we were in an atmosphere that would tend to make us do something original.

"Now, Mr. Gilbert said what I wanted to say. There are many ways of telling a story, but I am in the position of the man that was rescued from drowning; when the supposed corpse lay on the beach, his rescuer bent over him and while meditating what to do, he tore his hair and remembered that there were twenty-three rules for reviving a drowning man, and while he was thinking which rule to apply, the supposed corpse woke up and said: 'Did anyone say anything about brandy?' and then added: 'I do not care for the other twenty-two.'

"We ought to display ourselves on a high ethical plane and we are trying to. We have come across these plains, over the Divide, and have washed the superficial precedent of New England from us and are now in touch with Spain, the Spanish provinces and the Orient. I do not know how I could, without serious thought, phrase my expression of the ethical relations, but there is something here that strongly appeals to the heart. Once more bringing the best wishes of the friends in the East to you, I thank you."

Mr. Polk: "I have just received a telegram from Portland, Oregon, saying that the Portland Beaux-Arts Atelier, organized on October 18th, has twenty members and is a candidate for membership in the Architectural League of the Pacific Coast. I have also a telegram from E. F. Lawrence, Vice-President of the League, and really its founder, sending his hearty congratulations and sincere regrets for not being able to attend, having just returned from the East, saying nothing of the apology due to you for the non-appearance of the President of this league, who I expected to be present. Now the success of this session will depend on the work of the different committees."

Future Conventions.

It was decided that the conventions of the Architectural League of the Pacific Coast shall be held in rotation by the four cities now representing the League, and the series to be completed in the following order: Los Angeles, Seattle, Portland, San Francisco, this sequence to be permanent, and in the event of any other cities joining the League, they are to have the convention in the order of their joining.

The Nominating Committee, consisting of David J Myers, David Lewis, Fred H. Meyer, Myron Hunt, Sylvain Schnaittacher and August J. Headman, recommended the following names for election as officers of the League: For President, Alfred F. Rosenheim; Vice-President, E. F. Lawrence; Secretary, John Kremple; Treasurer, W. R. B. Wilcox.

The report of the Committee on Constitution and By-Laws follows:

ARTICLE I.

Name and Object.

Section 1. The name of this association shall be the Architectural League of the Pacific Coast.

Section 2. Its object shall be the advancement of the interests of the architectural profession.

Section 3. The means of attaining this object shall be, principally—

1st. By affiliating the architectural associations now existing and by the formation of similar organizations in cities where none now exist;

2nd. By a circuit of annual architectural exhibitions;

3rd. By an annual convention of architects;

4th. By the promotion of professional education.

ARTICLE II.

Membership.

Section 1. This League shall be composed of active, corresponding, associate, and honorary members.

Section 2. Any organization of architects within the region covered by the League shall be eligible for active membership.

Section 3. Any architectural organization outside the region covered by the League is eligible for the corresponding membership.

Section 4. Any architect of good standing in a community of this district, which supports no architectural organization, is eligible for associate membership.

Section 5. Any person notably aiding the cause for which this League is organized shall be eligible for honorary membership.

ARTICLE III.

Government and Officers.

Section 1. The government of this League shall be vested in an executive council comprised of three delegates from each of the associations which are active members.

Section 2. At each annual convention the executive council shall elect from among its own number the following officers, viz: President, Vice-President, Secretary and Treasurer, each with the customary duties of such office.

Section 3. All officers shall be ex-officio delegates and members of the executive council.

Section 4. All officers and delegates shall serve until their successors are elected.

Section 5. For the purpose of the convention of 1909, all present who are members of associations belonging to the League shall act as members of the executive council in the election of officers for the ensuing year.

ARTICLE IV.

By-Laws.

Section 1. The executive council shall draw up By-laws for the transaction of business, and shall have power to change such By-laws from time to time by two-thirds votes.

A motion was thereupon made to adopt the report of the committee as a whole, which was duly seconded and carried.

Report of Medal Committee.

The Medal Committee reported as follows:

"Mr. President and Gentlemen: The committee to investigate the advisability of offering a medal for the most successful building erected on this Coast during the past five years has duly considered and argued the matter both among themselves and with outsiders. It has been generally considered both impractical and inadvisable to make such an award; firstly, the difficulty of selecting a jury for this purpose is manifest, and, secondly, the bickering, jealousy and selfishness of the aspirants would tend rather to keep them apart than draw them together, and, therefore, abort the prime motive of the League. In selecting the jury, we would undoubtedly choose from among the most noted and successful architects at hand, and these themselves would, in all probability, be aspirants for the award. In general, the big man, the capable man, the generous man would be without doubt that man who should receive the award, but he, owing to his character and strength, would be the first to vote for a less meritorious aspirant. We hear that the Los Angeles Chapter of the A. I. A. has voted down the same proposition, but our very worthy conferere from Los Angeles, now serving on this committee, has made a very wise suggestion, which we think it advisable to consider at large at this convention, and that is—in place of awarding the prize for the best building, it might be wise to award the prize to the man who has made the most successful efforts in general, not only on one building, but on many. In other words, the attainment of the man should be rewarded, for opportunity builds the building, influence and politics have a great deal to do with the selection of the architect and frequently the biggest buildings are not those that mark the greatest attainments. For this reason, we deem it advisable to accept Mr. Rosenheim's suggestion and with your kind permission, under the head of new business, we shall make a motion to the effect that the architect on the Pacific Coast, being a member of the League, whose performance has been crowned with the greatest artistic success should be awarded the medal of the League, and that a jury of five architects be selected to make the award.

Respectfully submitted,

A. F. ROSENHEIM,
G. B. McDOUGALL,
G. ALBERT LANSBURGH."

Motion was thereupon made to refer the report of the committee to the Executive Council, and upon being duly seconded, was carried.

Work for Students.

The report of Committee on Work for Students was presented by Mr. Bakewell, as follows:

"Mr. President and Gentlemen:

"The Committee on Education and Scholarships reports that at a joint meeting of the two committees held on Monday afternoon, the following recommendations to be presented to your body were adopted: In the first place, the committee discussed the best method of organization of student work. Mr. Gould and Mr. Myers reported that the work in Seattle was in the hands of Architectural Clubs and Mr. Myron Hunt reported the same thing from Los Angeles. Your committee decided that the best method of proceeding would be in conjunction with the Architectural Clubs of each locality, and it was suggested that the San Francisco members of this committee try to organize a class in connection with the Architectural Club of San Francisco.

"Second, it was decided that a central jury of San Francisco men be appointed by this committee, and that they shall pass upon the merit of all work done in connection with the Coast League. The monthly exhibits and judgments to be held in San Francisco by a jury, no voting members of which shall be teachers of the various classes. The second class problems and order problems issued by the Society of Beaux Arts Architect shall be the programs used for the present, the current one being that for the first problem. The date of judgments shall be established later and shall be arranged to fit in with the annual exhibit of the A. L. P. C.

"For the encouragement of the students, the sum of $1000.00 shall be raised by this committee to be used for a first prize or traveling scholarship and other minor prizes or medals as may be determined later."

Motion was thereupon made to refer the report of the committee to the executive council, and upon being duly seconded, was carried.

Sylvain Schnaittacher, for the committee on Plans for the annual exhibition, reported in favor of joining the American Federation of Art and recommended that the individual societies and members comprising the League, be requested to join and to assist in encouraging the objects of the Federation.

Motion was made to refer the report of the committee to the executive council, and upon being duly seconded, was carried.

In Memory of Chas. F. McKim.

John Galen Howard reported for the Committee on Resolutions as follows:

Whereas, in the death of Charles Follen McKim, architecture has suffered a grievous and irreparable loss; therefore be it

Resolved, that the Architectural League of the Pacific Coast now in convention assembled, herewith record its deep sorrow and express its heartfelt sympathy with the bereaved family, professional associates and close personal friends.

"Mr. McKim had for a long time stood acclaimed the dean and pattern of architects, not by reason of his works alone, though these be of the greatest, but for the unswerving fortitude with which he bore aloft the standard of the purest, the highest, the most vital of the ideals of art. He was a great architect, a creative mind, a persistent will, a warm heart. He gave himself to the upbuilding of a noble tradition. His hand, his voice, his purse, were always ready in the great cause. Where he worked, architecture budded and blossomed because of him, whether in stone and mortar, or in the hearts of men quickened to their task by his largess of sympathy and help. His place among the Immortals is assured beyond peradventure. His works and his example are our priceless heritage."

A motion was offered to properly engross the foregoing resolution on the minutes of the meeting and forward a copy of the same to the family of the deceased, also to members of his firm, to the different architectural journals, to the American Institute of Architects and to other architectural clubs or institutes. The resolutions were adopted by a rising vote.

Closing Session.

After recess Mr. Polk, upon calling the convention to order, announced that following the meeting there would be an exhibition of drawings and an address by Mr. John G. Howard, after which the visiting members would be given an automobile ride around Berkeley.

The report of the Committee on Nominations was next in order. The Secretary was directed to cast a ballot for the respective candidates, which action also carried with it the holding of the next convention in Los Angeles.

President-Elect Rosenheim, upon taking the chair, addressed the convention as follows:

"Gentlemen of the Convention: I am so moved by this manifestation of confidence that I am utterly at a loss for words with which adequately to express my appreciation of the honor you have bestowed by electing me your President. But I will serve you with notice that, in my judgment, you have made a serious mistake, when I observe here how much excellent timber you have to choose from. I am sorely conscious of my shortcomings, but if you really have faith in my ability to steer the ship of state in the right channel, to enable me to do so, it will devolve upon you to lend your earnest co-operation in order to render this organization as effective and as influential as we could wish to have it. You have my assurance at all times that I will do my share of the work, of which there will doubtless be plenty."

Mr. Rosenheim then announced his selection of a standing committee on student work. He said: "You heard the report of that committee this morning, in which it stated that $1000 should be raised, to be used for a first prize, or traveling scholarship, and for other minor prizes or medals. In addition to that, it ought to arrange for an endowment fund. I understand that a subscription has already been started by our retiring President and he suggests that we should not raise less than $1000 annually."

The committee named consists of Messrs. Mullgardt, Rixford, Hunt, Howard, Lawrence, Myers, Gould, Farquahar and Bakewell.

A motion was made, which was duly seconded and carried, that the Architectural League of the Pacific Coast make application for membership in the National body.

Under the head of new business, the committee on award of medal recommended that the matter of giving a medal to the architect making the best exhibit and similarly rewarding the private citizen, corporation or company which does the most for improvement or in a public spirited way, be taken up with the San Francisco League, and a motion was made that this matter be incorporated with the other proposition regarding award of medal.

Motion was made, which was duly seconded and carried, that the Secretary be instructed to communicate with Mr. Brown, Secretary of the American Institute of Architects, notifying him of the existence of the League and requesting that it be placed on the mailing list and exchange list of the Institute: said motion also to include the Beaux Art Society and the Architectural League of America.

Mr. Mullgardt: "Mr. President, before closing this convention, I make a motion that a hearty vote of thanks be tendered to the out-going officers, to the Executive Council and to the various committees who had the exhibition work in charge."

The motion was duly seconded and carried.

There being no further business, on motion the convention adjourned.

* * *

Was Awake, Too

A Chinaman who just came over to the new land started a little laundry.

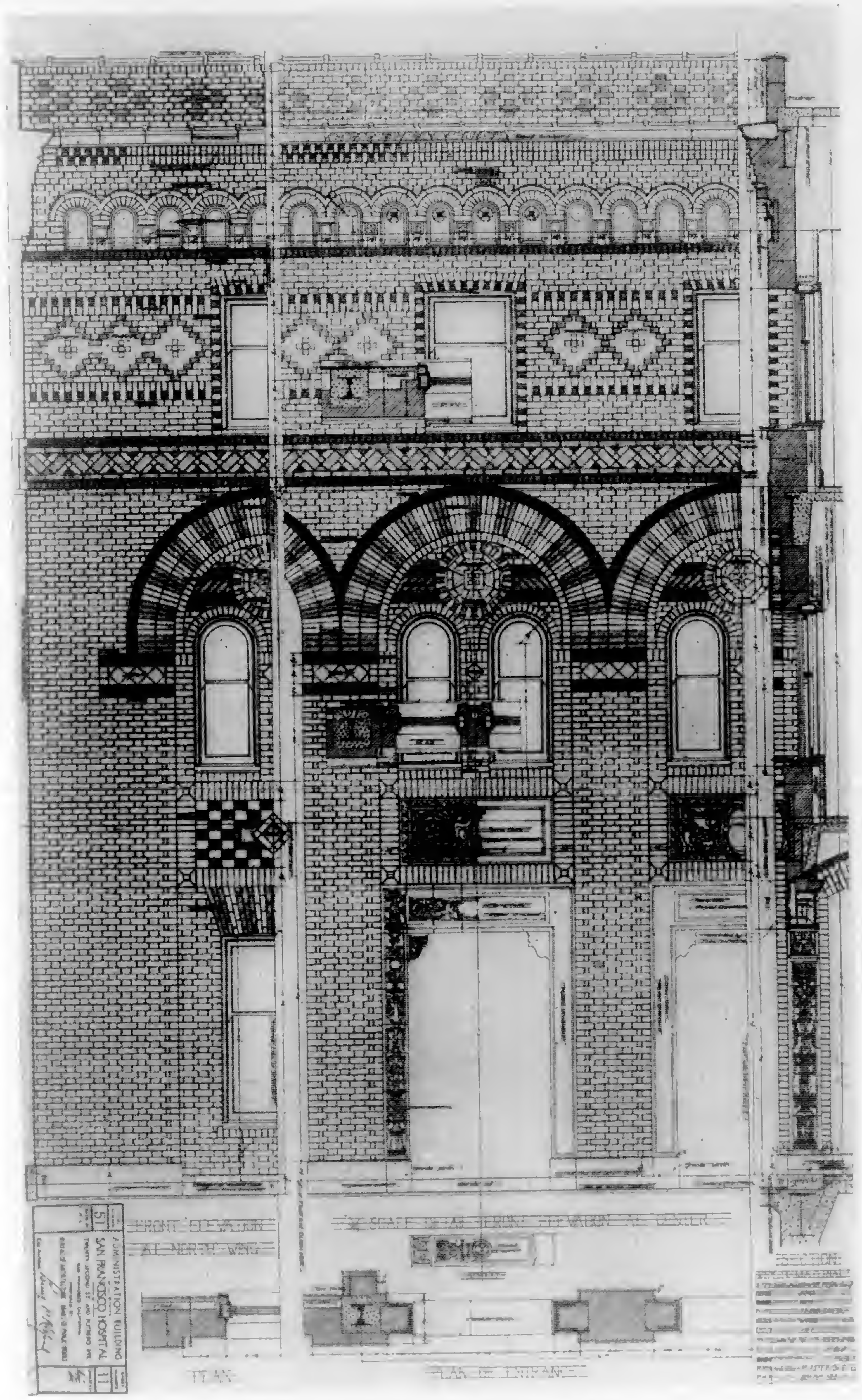
On one side of him was a hotel with the sign outside: "We Never Close." On the other side was a restaurant with this sign: "Open All Night."

The Chinaman, thinking he must have a sign, too, tacked up a little board with these words on:

"Me Wakee Too."

* * *

"I've got a good story to tell you. I don't think I ever told it to you before." "Is it really funny?" "Yes, indeed it is." "Then you haven't told it to me before."—Lippincott's Magazine.



Details San Francisco City and County Hospital
Newton J. Tharp, Deceased, City Architect



House of Mr. G. W. Wattles, Hollywood, Cal.
Myron Hunt and Elmer Grey, Architects

A Review of the San Francisco Architectural Club's Exhibition*

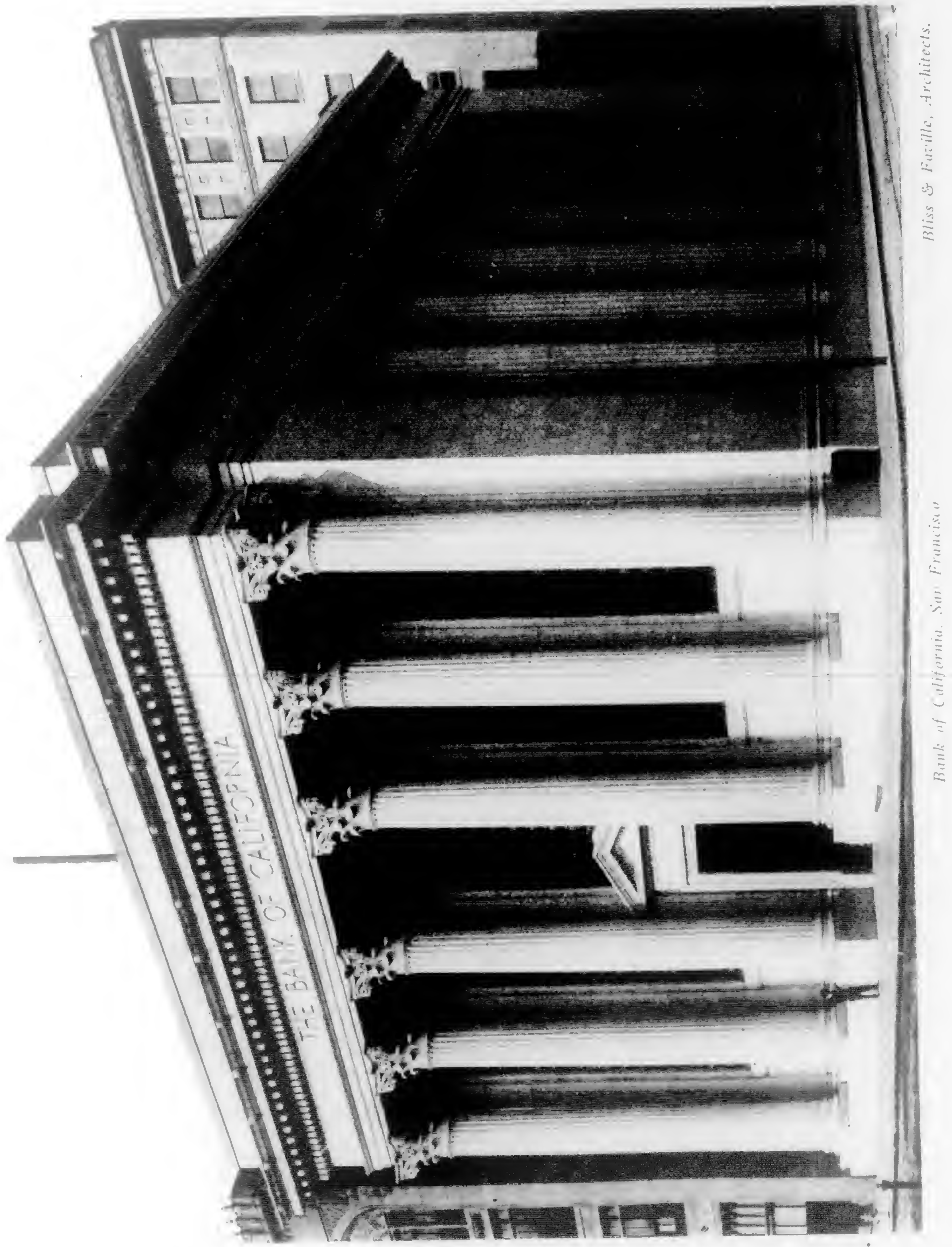
By AUGUST G. HEADMAN, President of the Club

A GENTLEMAN from London who visited our last exhibition, held in San Francisco October 18-31, was so inspired with the architectural display that he said he considered it his personal duty to write me these words: "Being architecturally inclined and a lover of art in general, I have taken great interest in your exhibition. It has been my pleasure to visit similar exhibitions in New York, Chicago, London and Paris; but while the display of architectural talent has been on a much larger scale in the above mentioned cities, I am pleased to concede that in assembly, completeness of detail, artistic and harmonious arrangement of material, your exhibition is equal if not superior to any I have seen."

How gratifying it is to receive such a letter and to know that we have not worked in vain. Our attendance for the two weeks reached the 12,000 mark by actual count, and when we consider the apparent lack of interest which is generally displayed by the public for affairs of this nature, the figures just quoted seem wonderful and, indeed, most encouraging to us, who find it difficult and practically impossible to educate the public to things artistic. However, we could see spirit, enthusiasm and appreciation in every visitor, especially so when a few would gather about a favored design.

For example, Mr. Louis P. Mullgardt's rendering of the Taylor home was a gem in architectural composition, color and atmosphere, worthy enough to hang in any art gallery. The house at Greenwich, by Kirby, Petit & Green, attracted much attention, which such a worthy design rightfully deserved. It is regretted that this delightful creation did not appear in the Year Book, as the architectural composition is charming and the

*Many of the illustrations accompanying this article are taken from the Year Book of the San Francisco Architectural Club, which was published in connection with the annual exhibition.



Bank of California, San Francisco

Bliss & Faville, Architects.

rendering even more so. Charles A. Platt, William Knowles, Lawrence Buck, Elmer Gray and Myron Hunt are to be complimented on their charming homes, all so expressive of their authors, as is Wilson Eyre, forever known for his original rendering and splendid compositions. What a great consolation it must be to one to know that his work can be so distinctive from his fellow men and still be successful! Cass Gilbert's West street office building, a structure of true expression and noble proportion, charmed many. D. H. Burnham and Co., Willis Polk, designer, exhibited many interesting suggestions. For example, the People's Gas Company's building, from the Chicago office, is a masterly rendering, exceptionally well handled. We can learn much from this building. Frederick H. Meyer's structures always attract attention. His competitive design of the Union Trust building was greatly admired, likewise the Kohler & Chase structure, a practical building of pleasing lires.

An office building by Mr. A. Warren Gould was delightful in its simplicity and showed much thought and study. Dickey & Reed's design of the Oakland City Hall was entirely different from the stereotyped city hall designs, being good in its proportions and possessing many excellent motives. Howells & Stokes exhibited among other things a design for a municipal office building for New York city, an inspiring composition some thirty-six stories high. Bakewell & Brown's Berkeley Courthouse transports a French hotel de ville into our midst. It is a charming design, and the pencil rendering shows the masterly hand of its author.

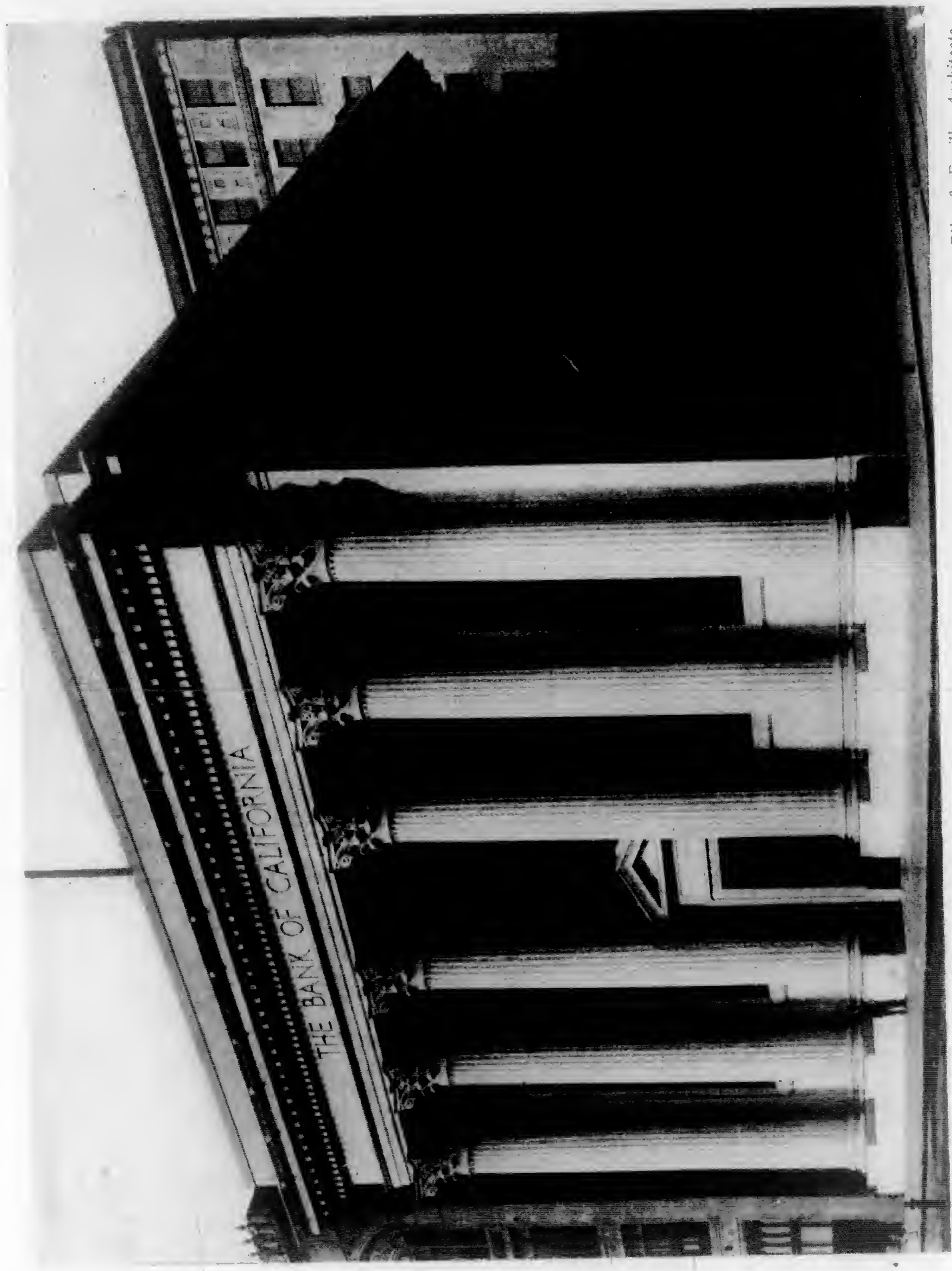
The Phelan and Head office buildings, by William Curlett & Son, hold their own in any company. The renderings, which make beautiful and clear reproduction, are by Berdett Long. Two designs by Sutton & Weeks and one by Louis P. Hobart, to wit, the White Investment Company's building, shows us another step toward the improvement of office building architecture in San Francisco. MacDonald & Applegarth's Heineman office building is a wonderful conception on a small lot, and entirely successful.

The Columbia Theater, by Bliss & Faville, a well studied and an expressive facade, is splendidly executed in color. The design is worthy and inspiring and a big step in the right direction. City Architect Loring P. Rixford's designs show what improvements have been made in the city municipal work, and Mr. Cahill exhibited a very logical and well studied scheme to improve the present City Hall site and its surroundings.

In the line of clubhouses Bakewell & Brown, B. R. Maybeck, Walter H. Parker, George W. Kelham, Loring P. Rixford, Crim & Scott, Valare De Mari and others exhibited some very interesting and expressive designs of social life. George B. Post & Son of New York city are to be congratulated for sending us an original drawing of the interior of the Wisconsin State Capitol, and not photographs, as most of our Eastern colleagues favored us with. A. D. Nicholson's measured drawing of the Santa Croce in Rome, exhibits much time and thought and was appreciated by those who have attempted such work.

The design for the new Grace Cathedral, by Cecil G. Hare of London and L. P. Hobart, associated architects, created considerable attention, it being designed in England, the home of Gothic, and presents a good occasion to compare it with examples of other Gothic work done in America, such as the ecclesiastical designs by Cram, Goodhue and Ferguson; an Episcopal Cathedral, by E. H. Hildebrand and A. D. Nicholson.

The ever increasing influence at work for good architecture was clearly demonstrated by our architectural schools in the work presented by the University of California, Massachusetts Institute of Technology and the University of Pennsylvania.



Bank of California, San Francisco

Bliss & Faville, Architects.

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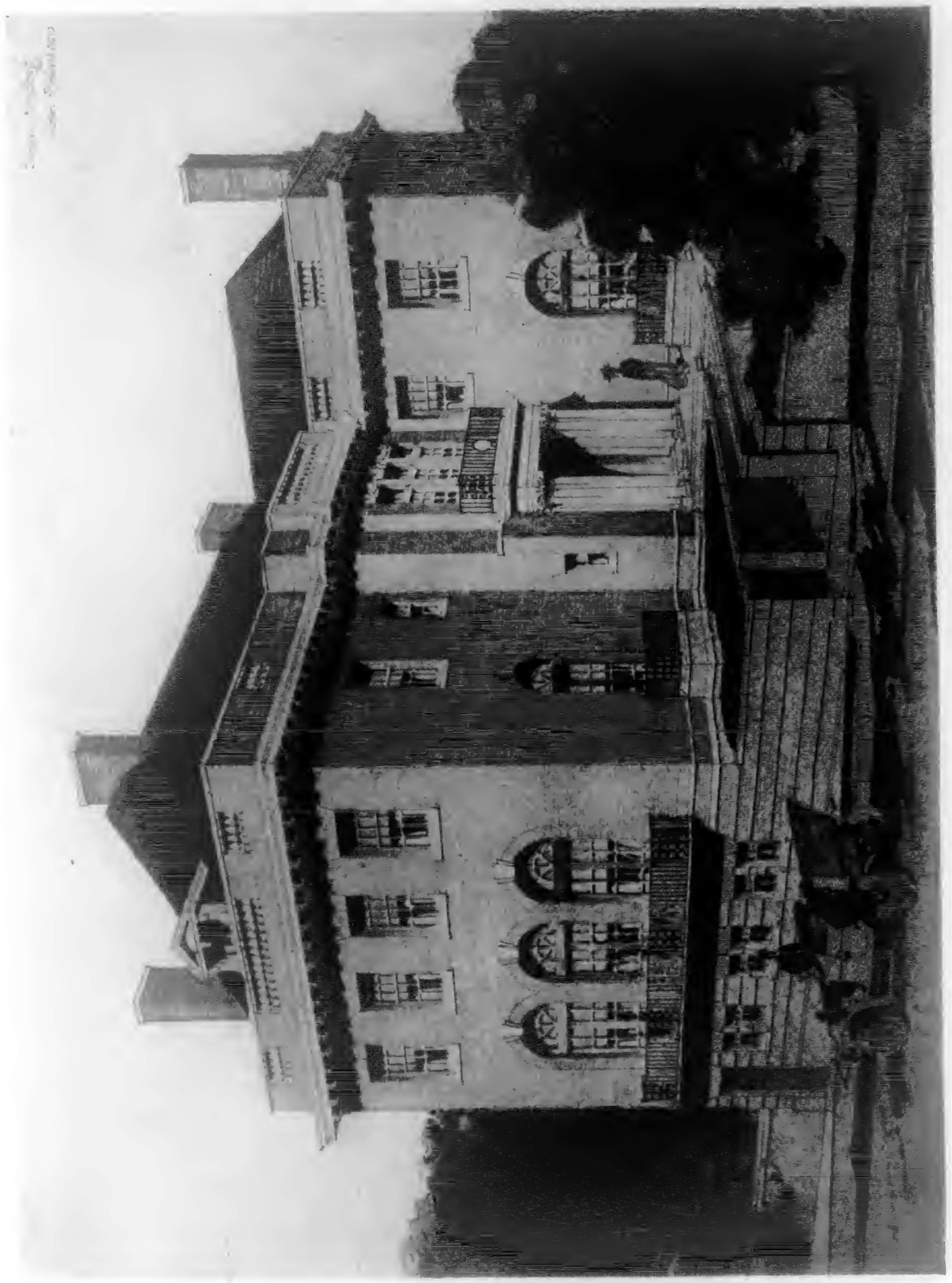
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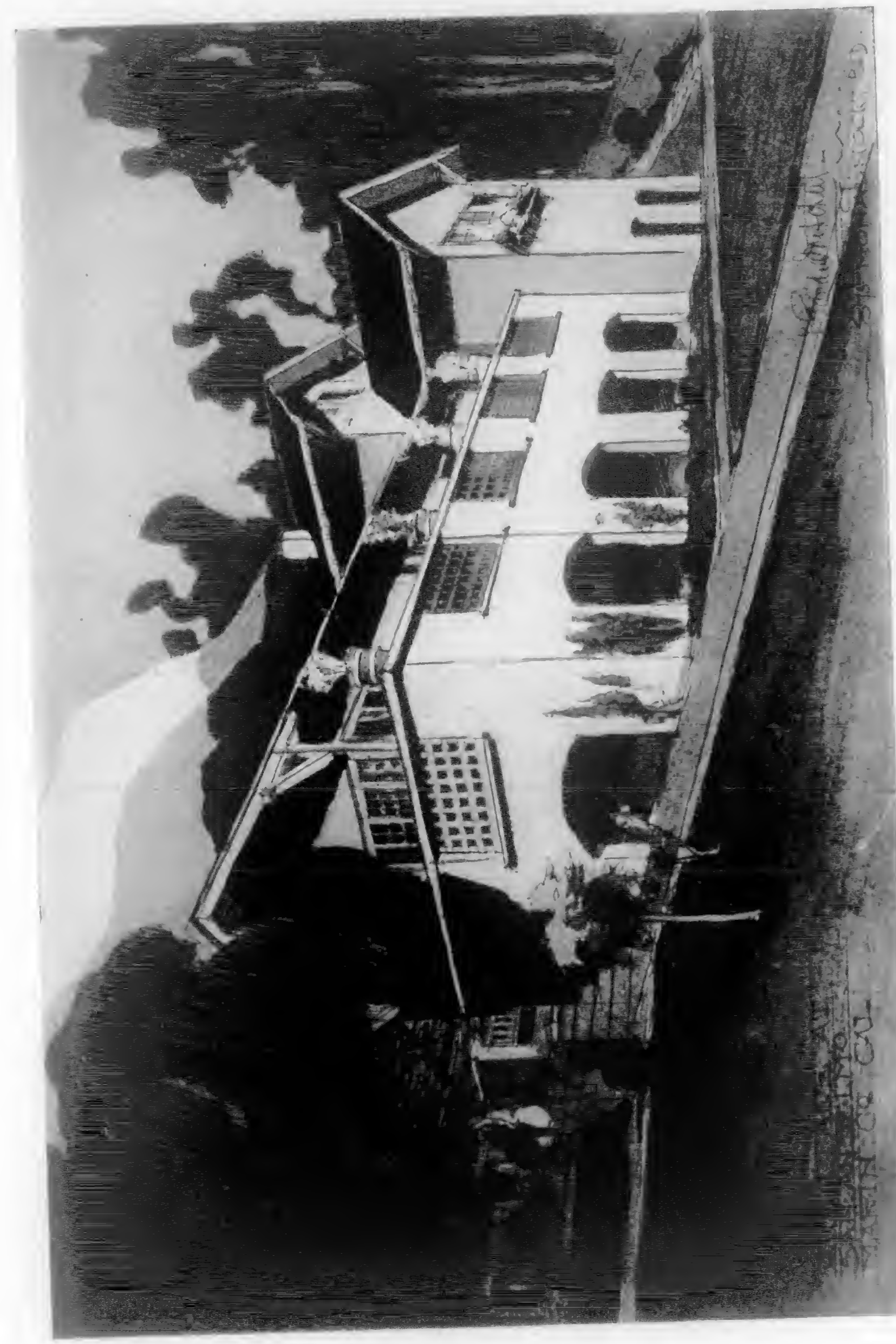
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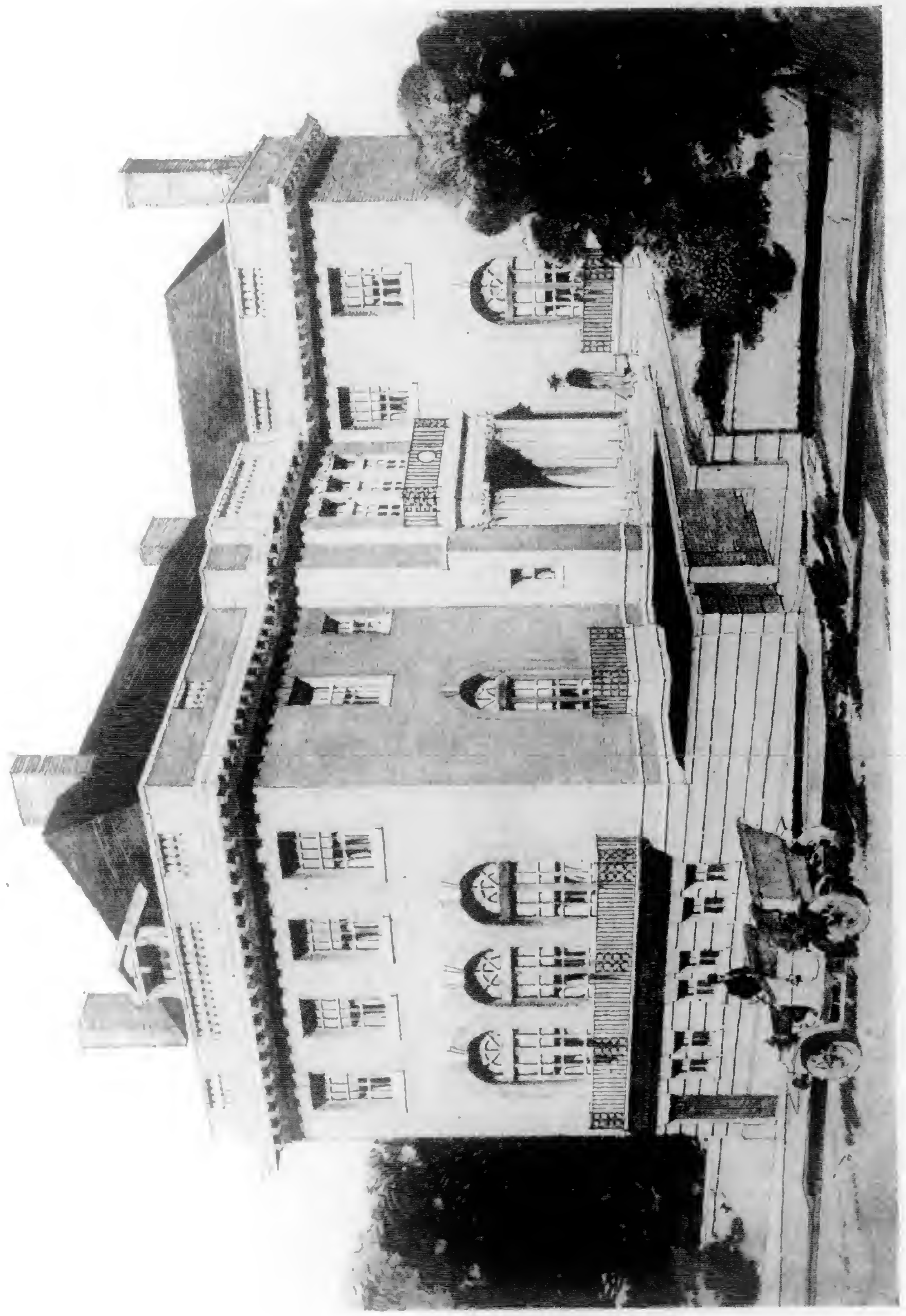
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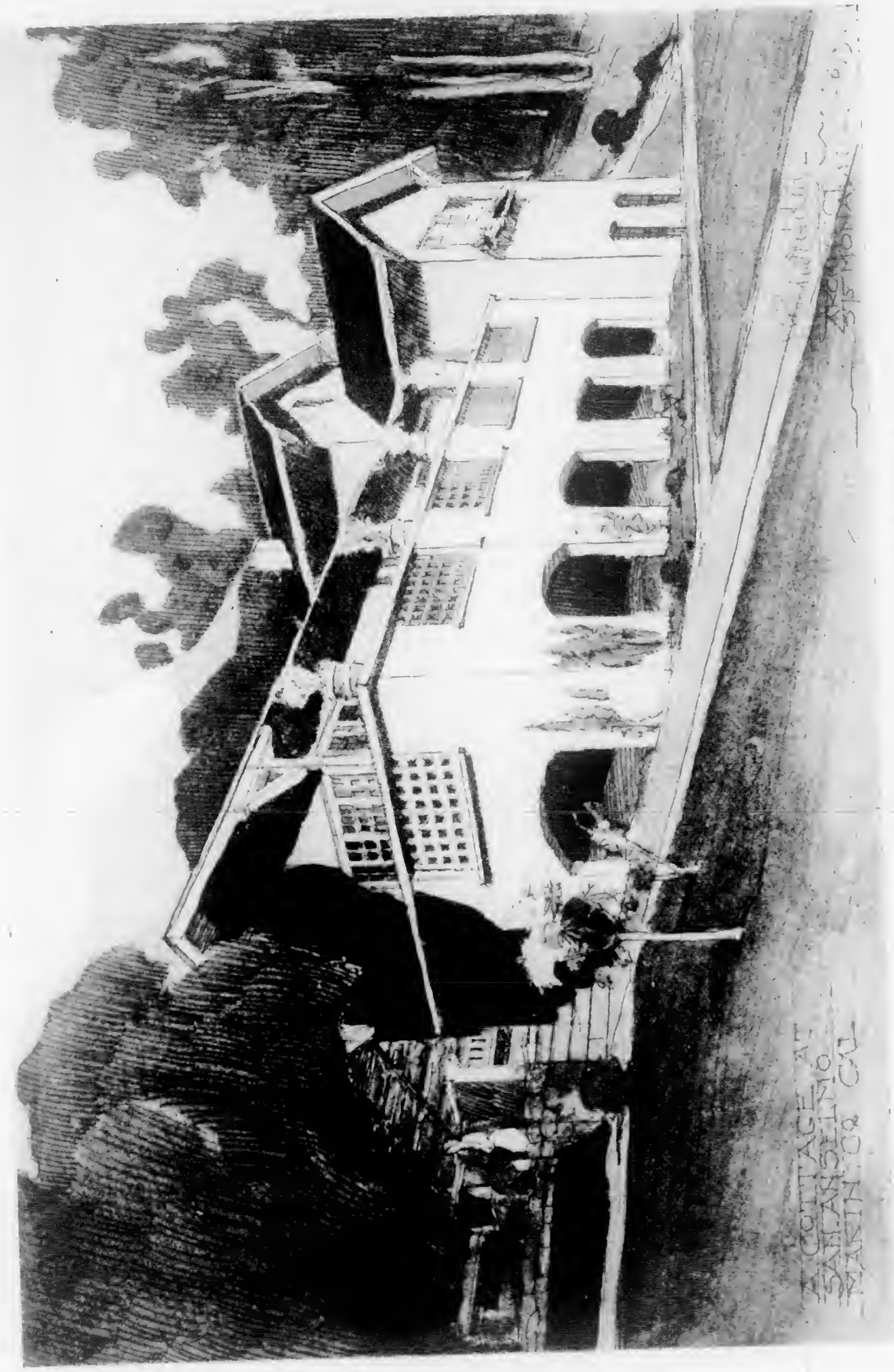
Residence of Mr. Alexander Heynemann, San Francisco   Houghton Sawyer, Architect



Hillside House at San Anselmo, Cal.   W. Garden Mitchell, Architect



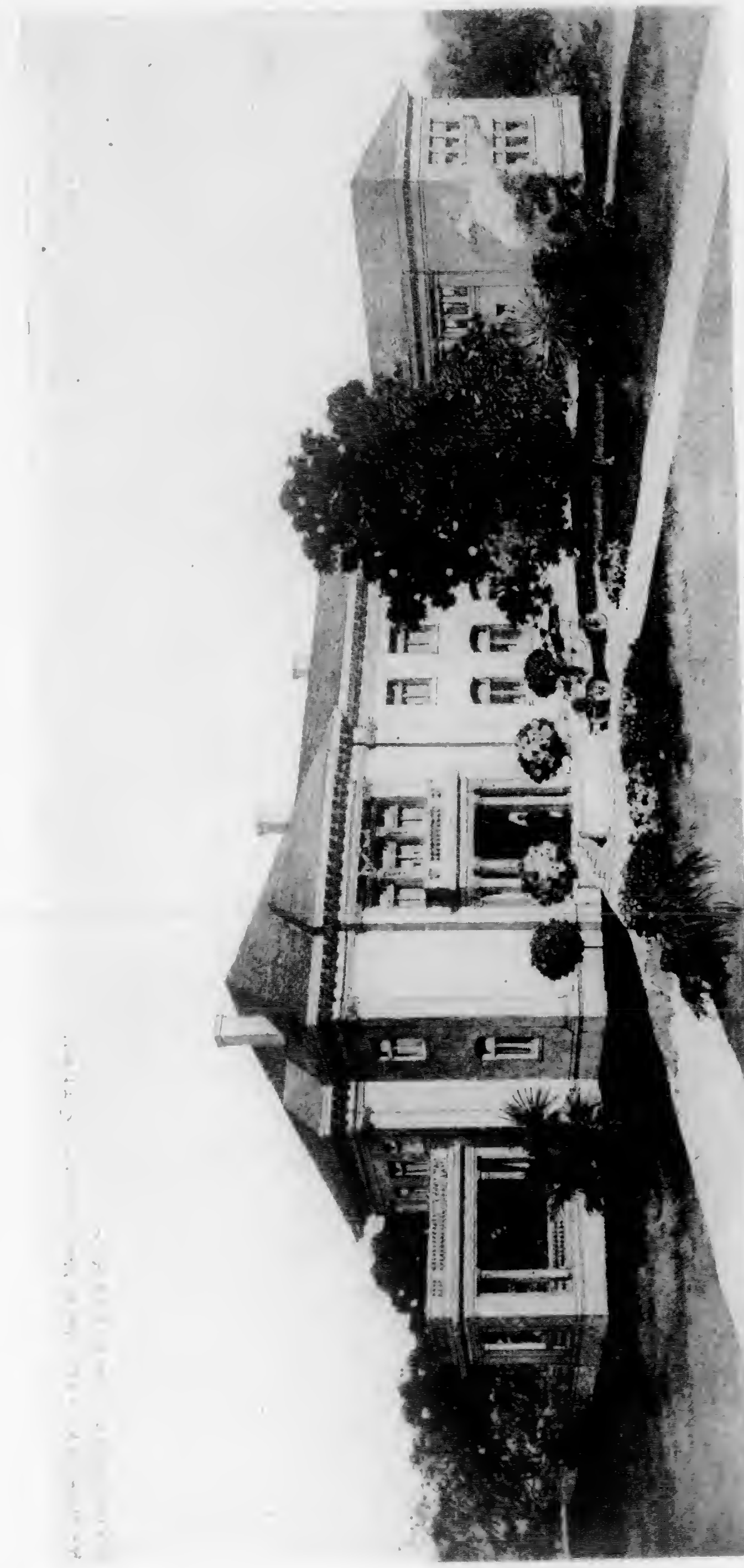
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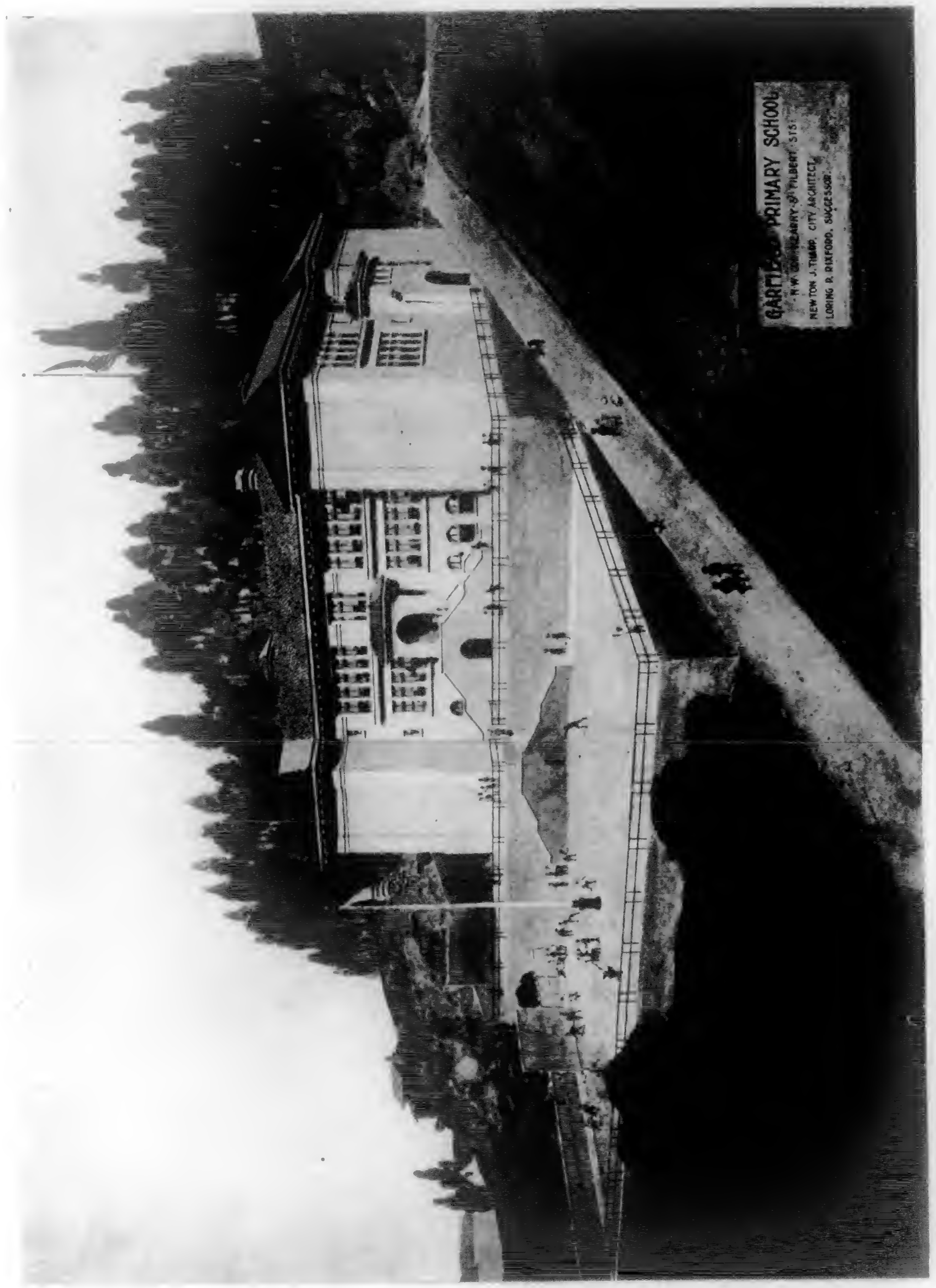
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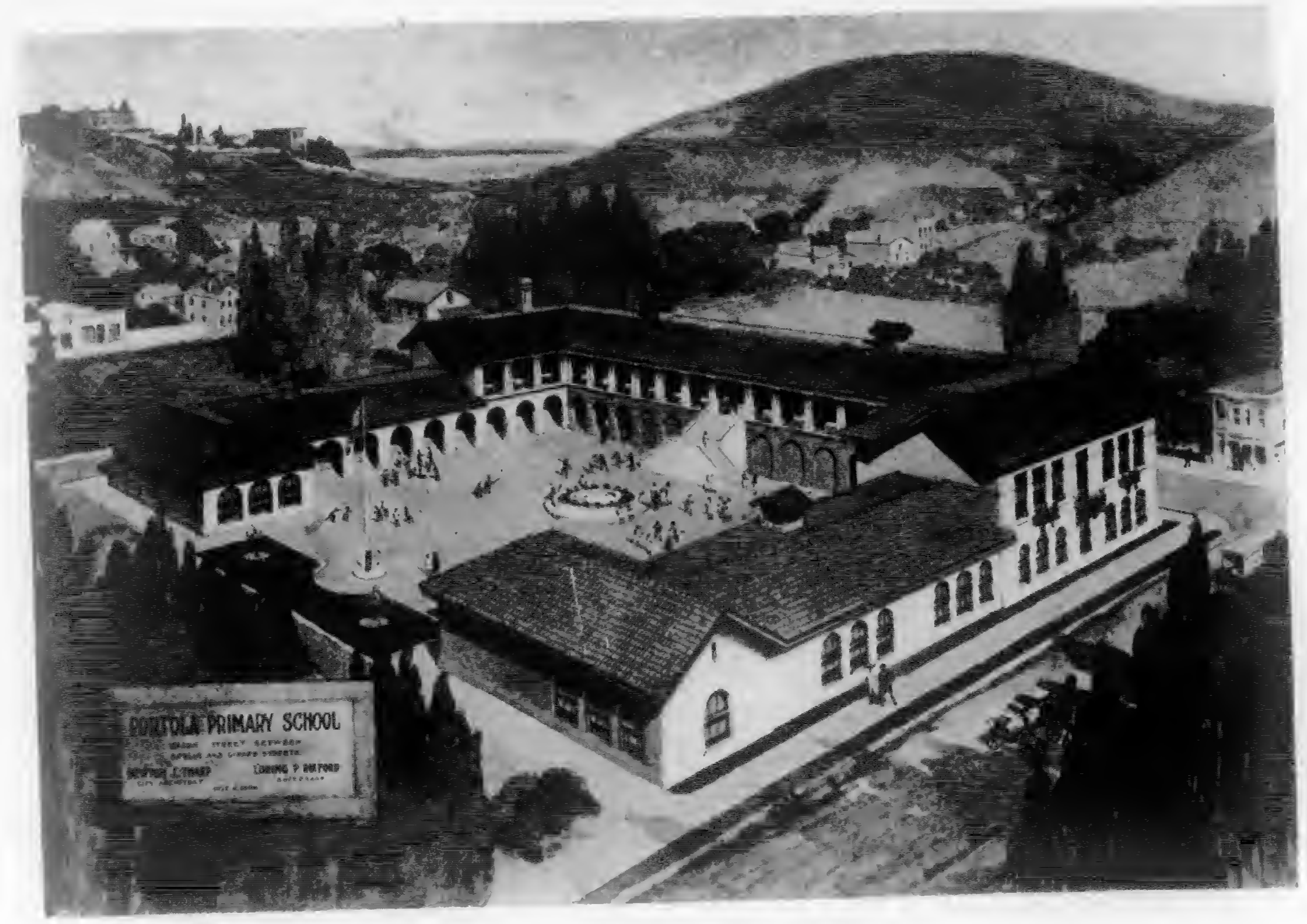
Residence for Mr. Robert C. Gillis, Santa Monica, Cal.
Myron Hunt and Elmer Grey, Architects



Residence for Mr. and Mrs. Louis Stern, Fair Oaks, Cal. *Houghton Sawyer, Architect*



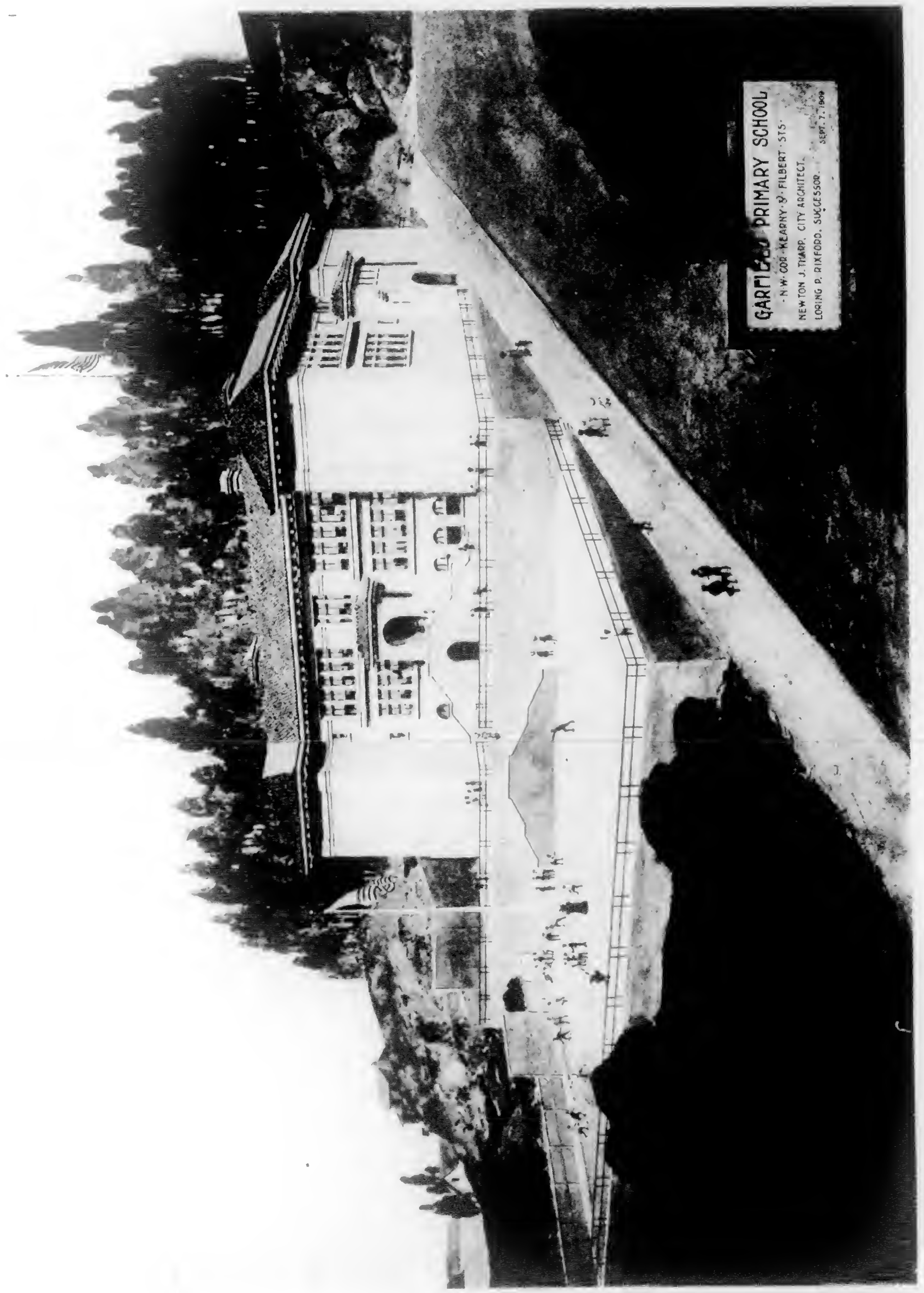
Garfield Primary School, San Francisco



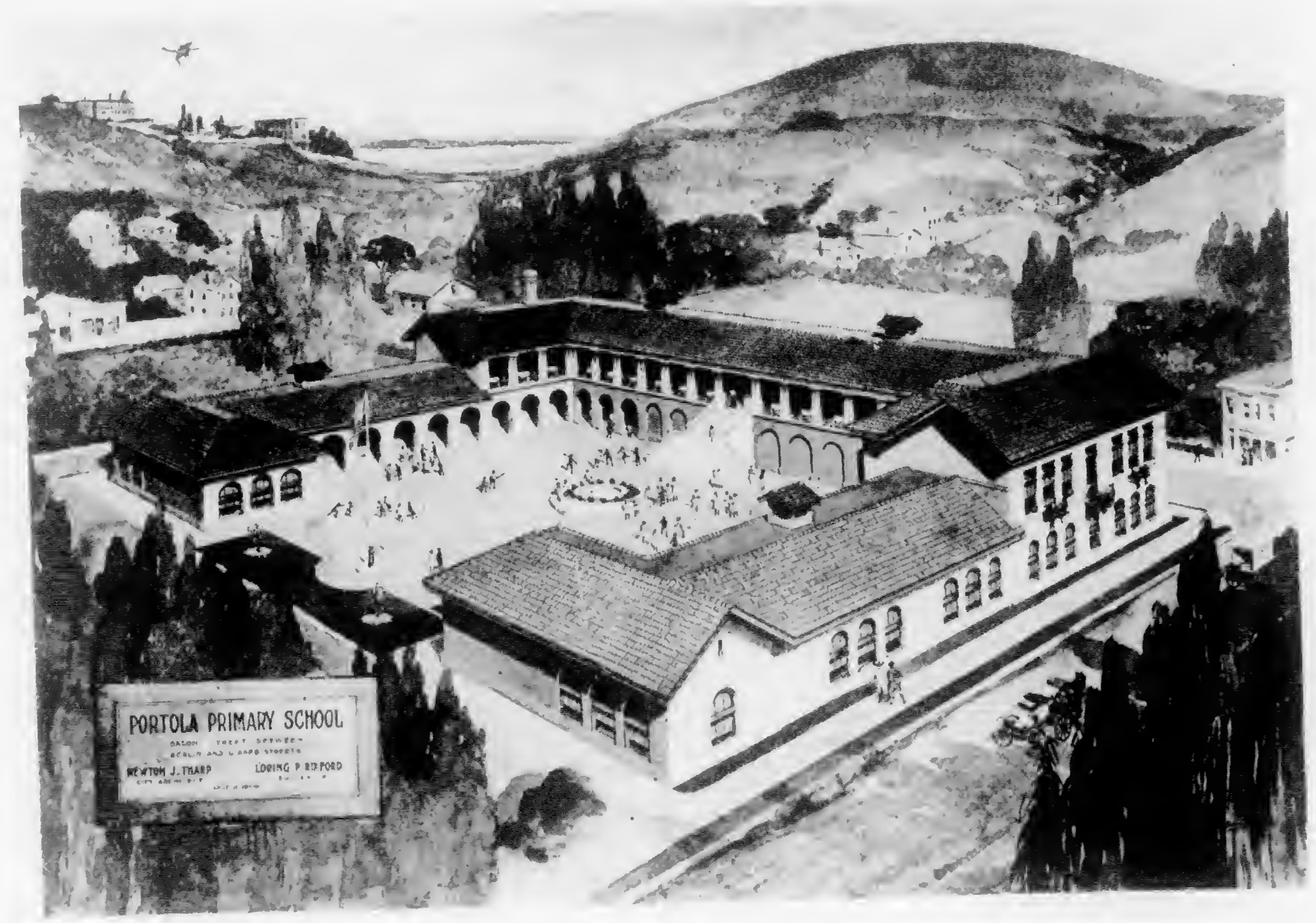
Portola Primary School, San Francisco
Newton J. Tharp, Deceased, City Architect



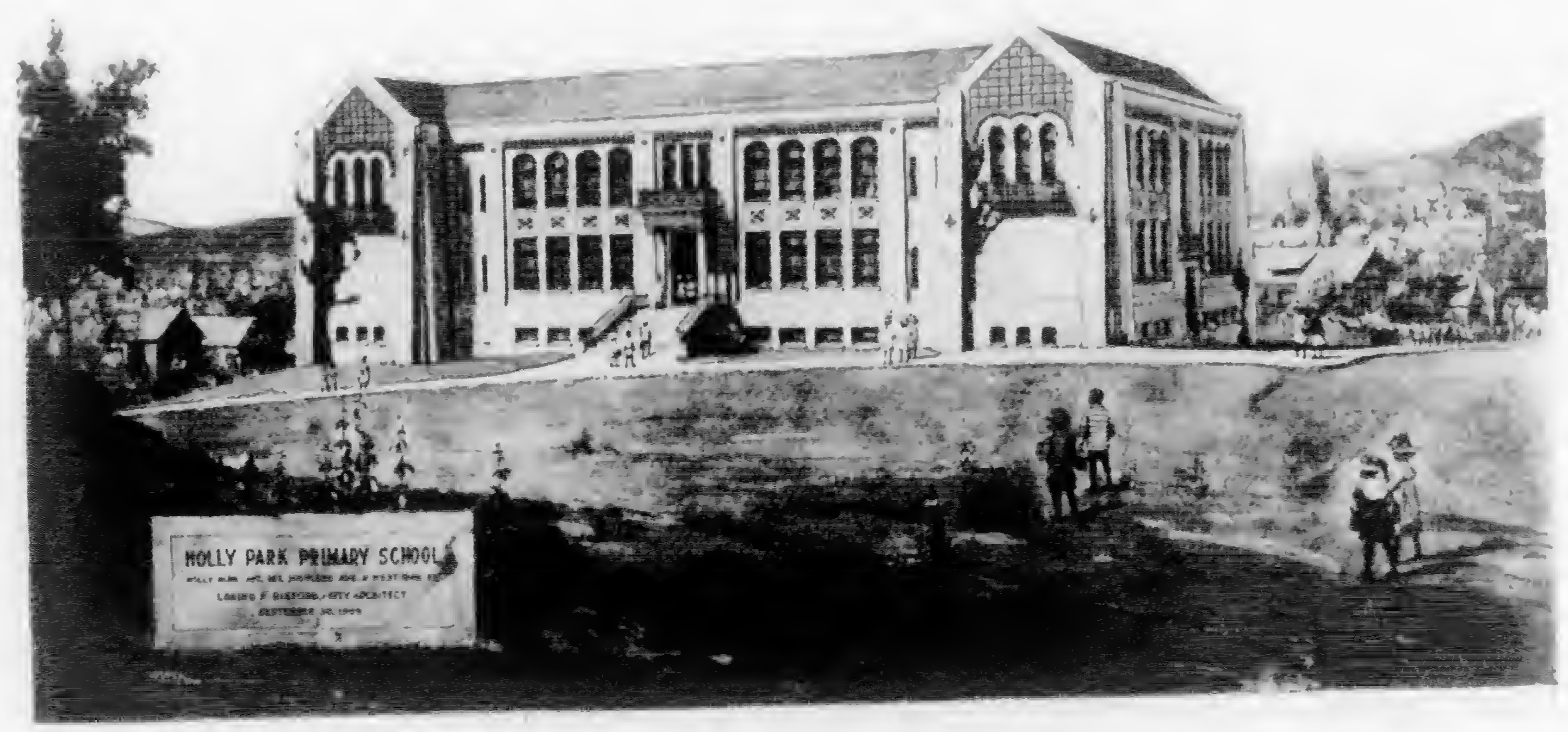
Holly Park Primary School, San Francisco



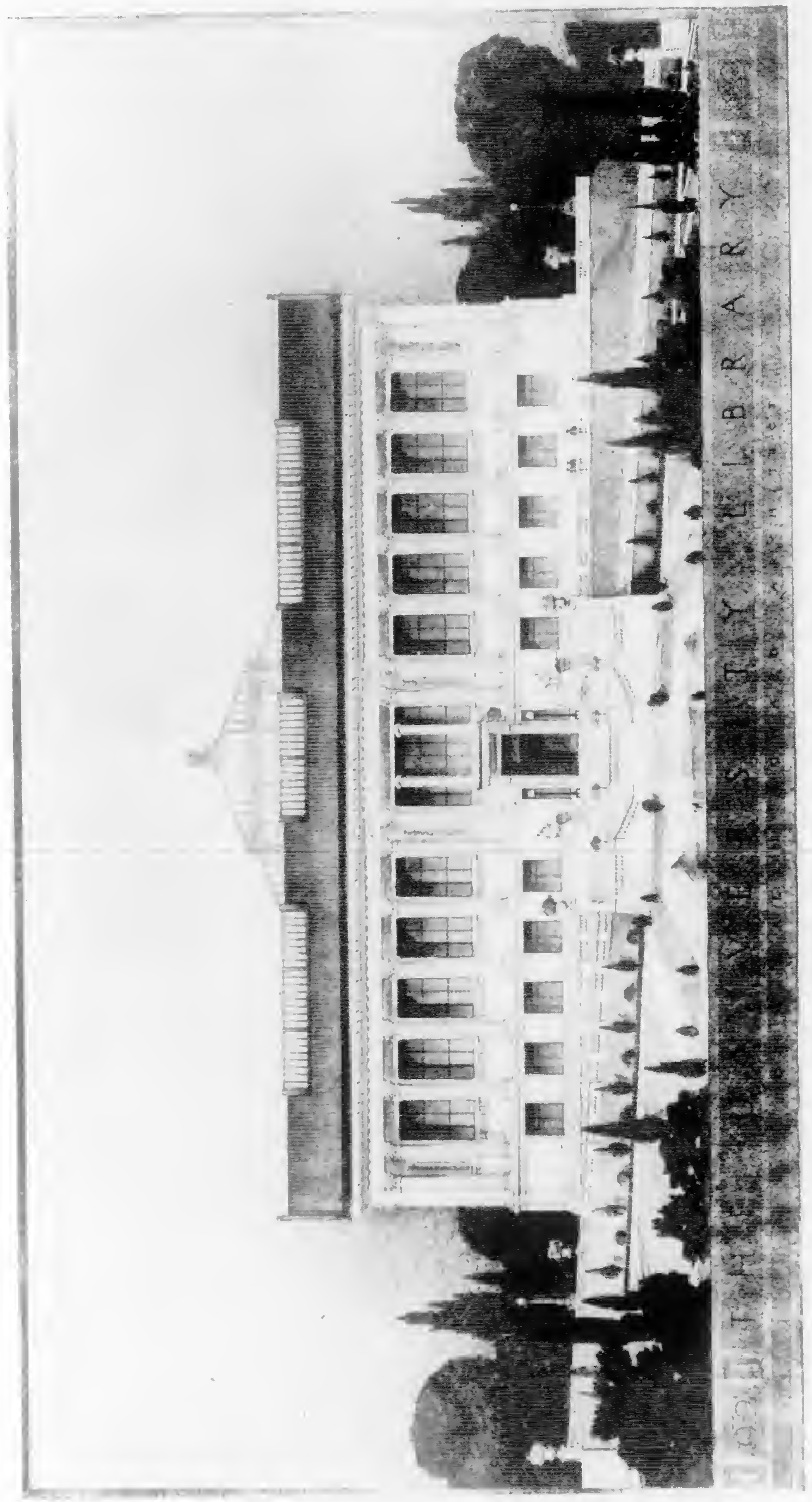
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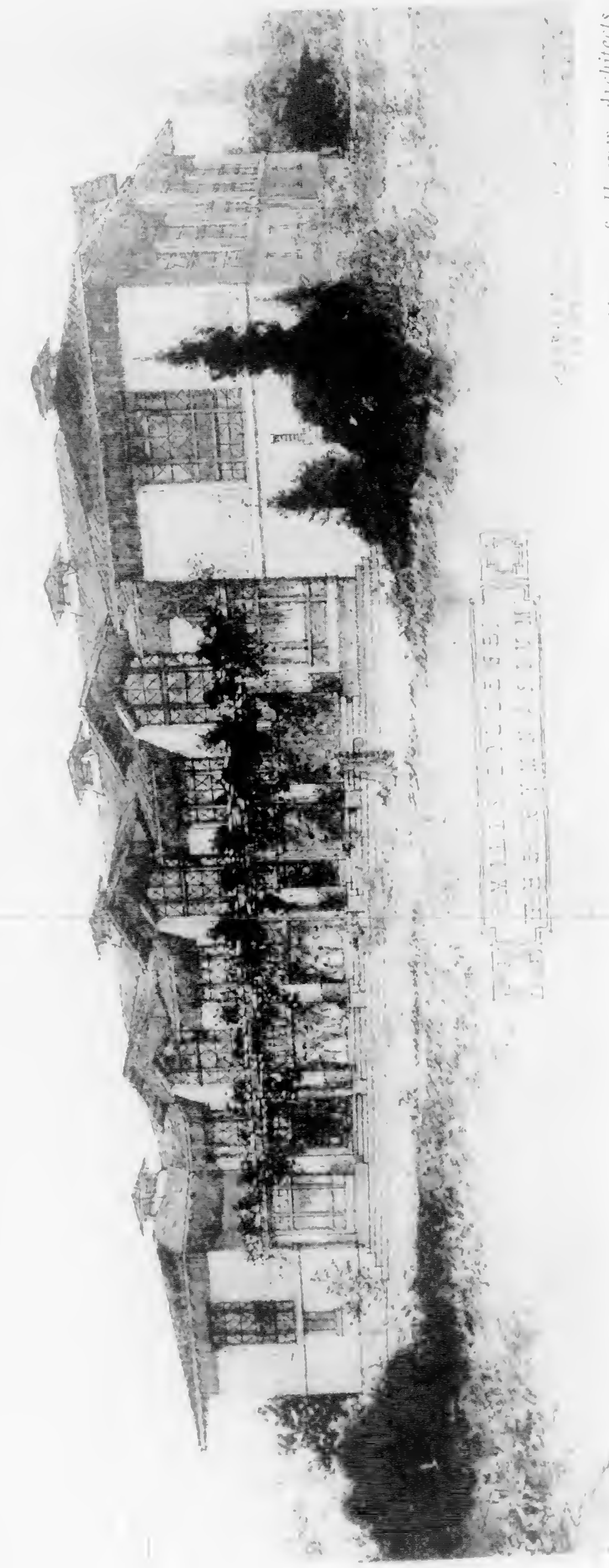
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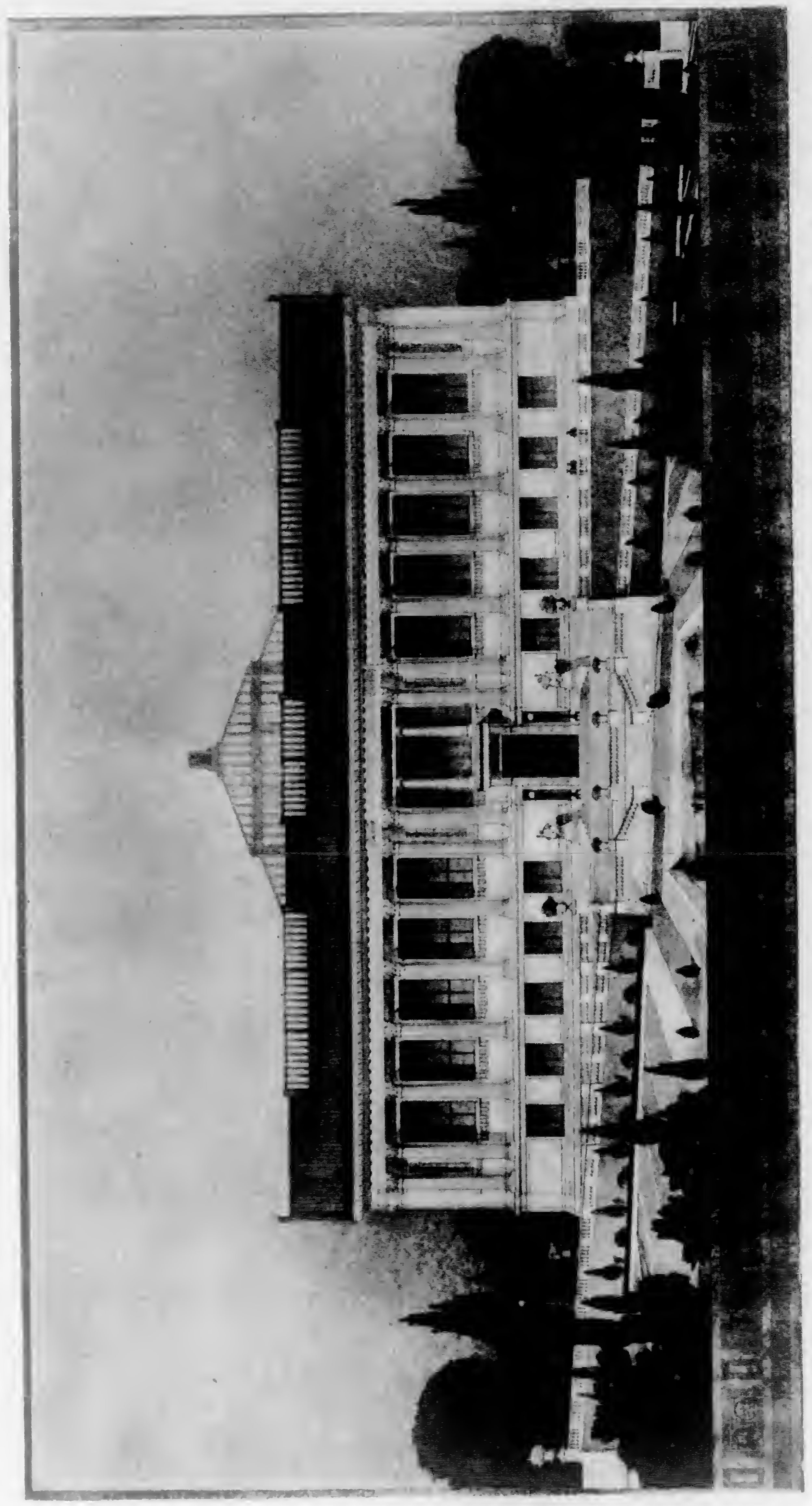
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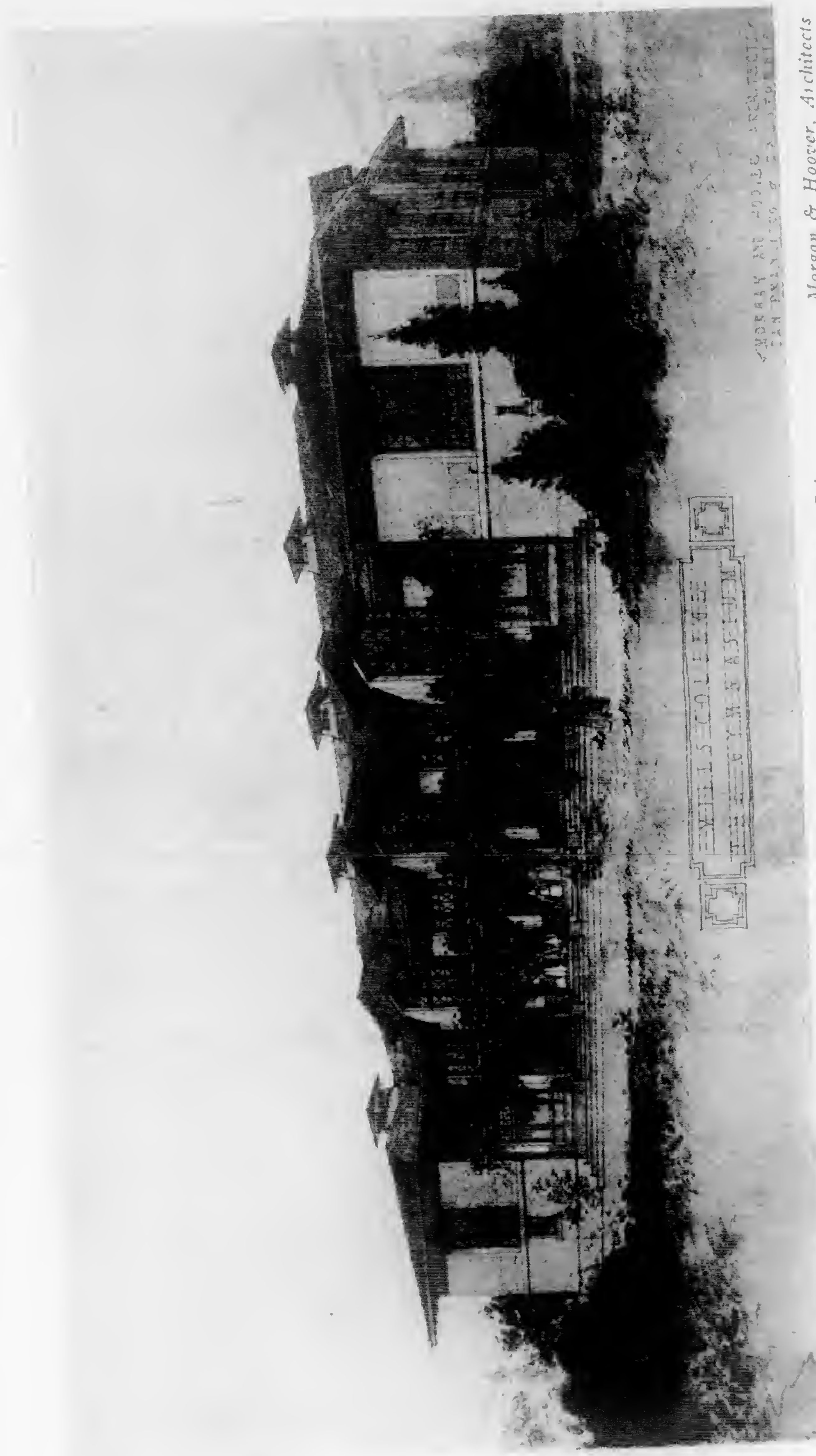
The University of California Library, Berkeley, Cal. John Galen Howard, Architect



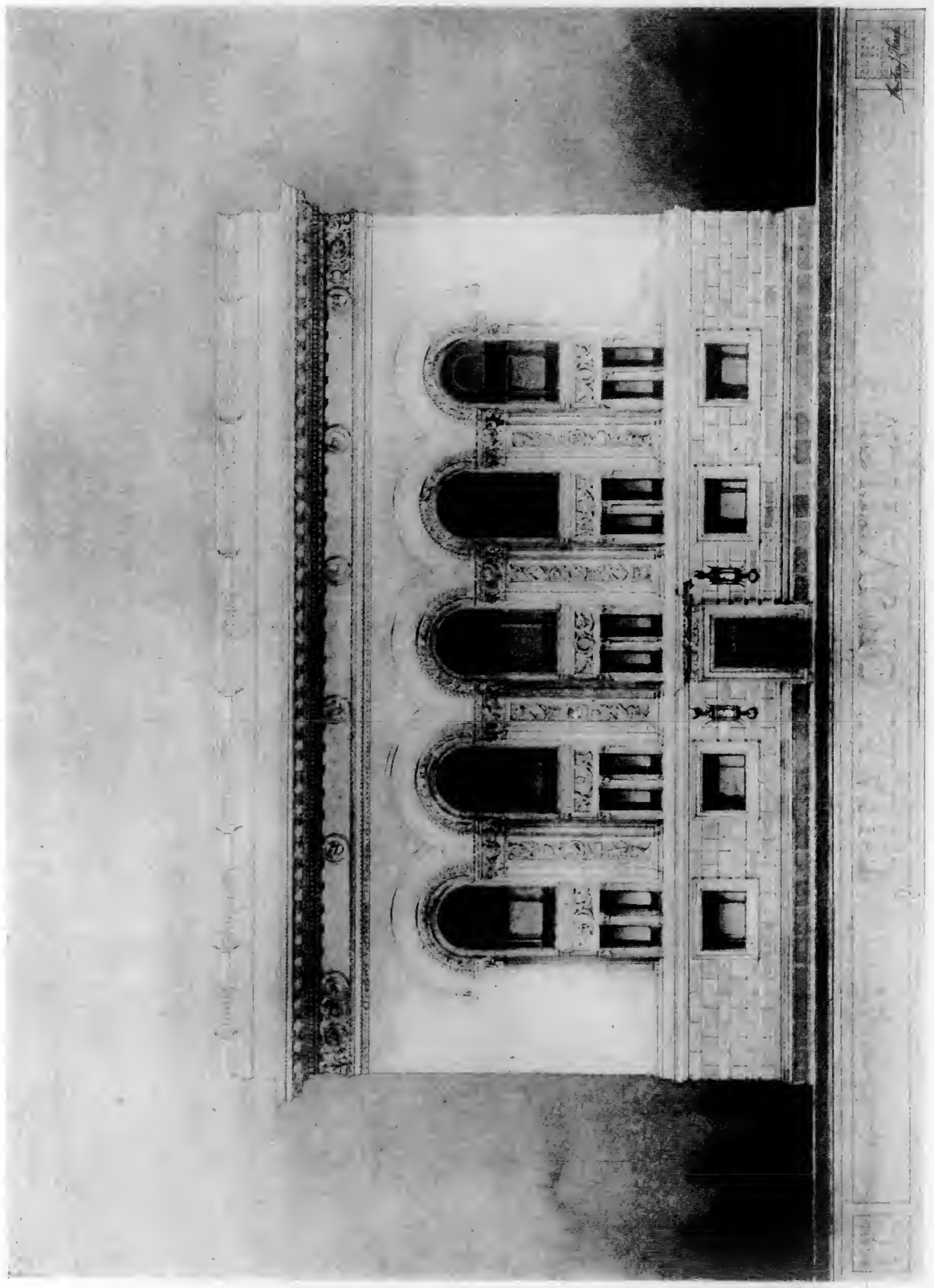
Mills College Gymnasium, Oakland, Cal. Morgan & Hoover, Architects



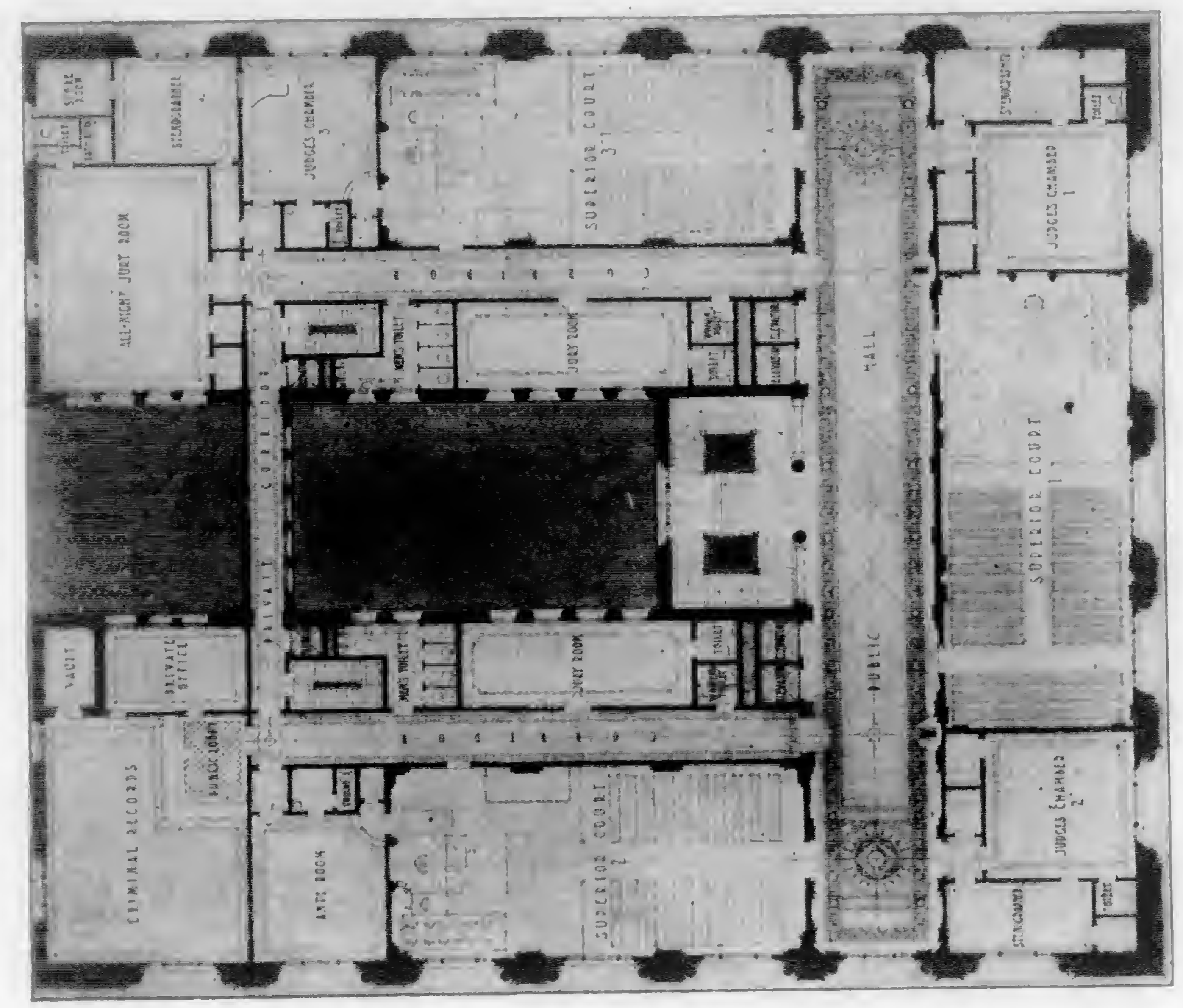
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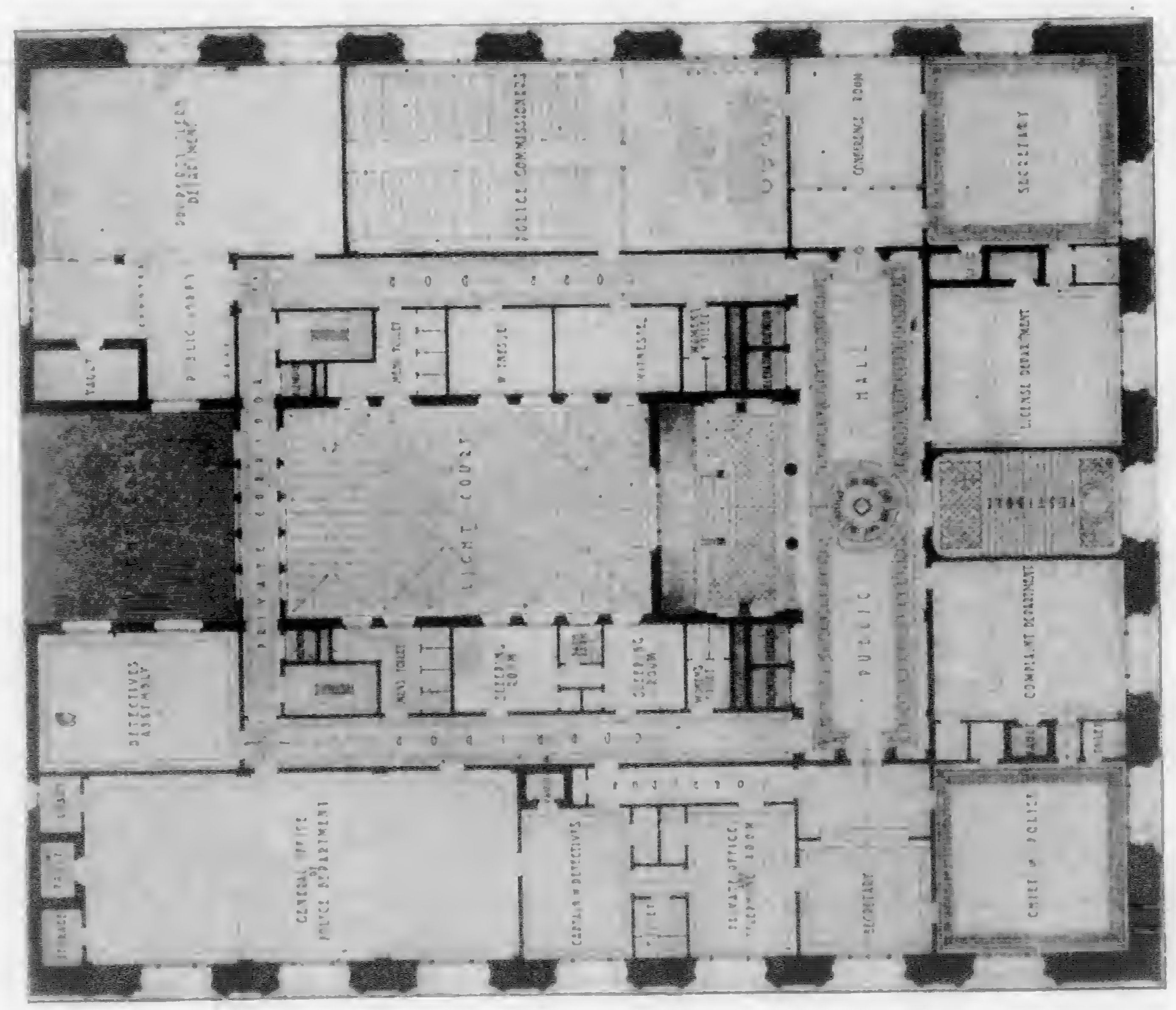
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Hall of Justice, San Francisco. Newton J. Tharp, Deceased, City Architect

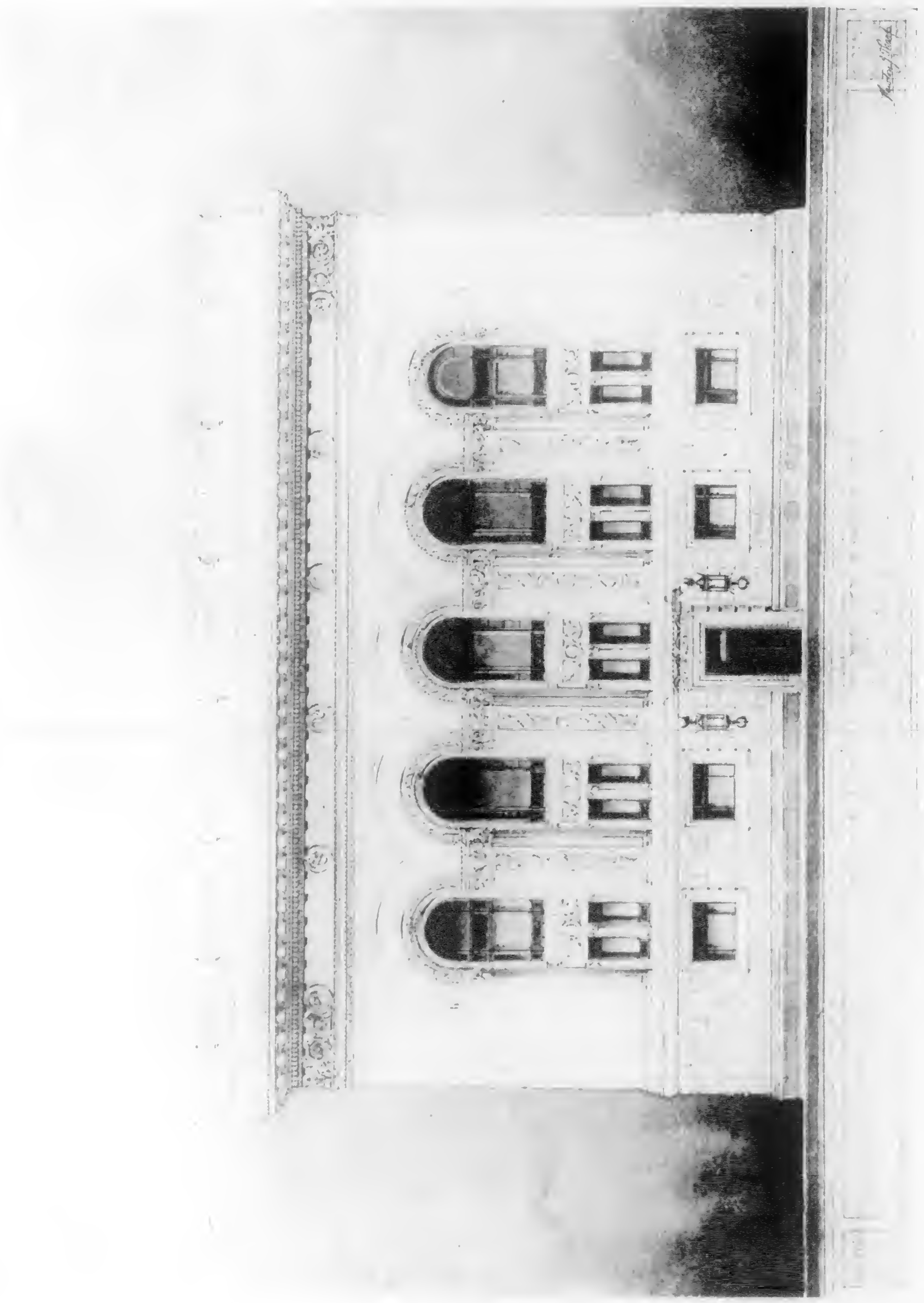


Third Floor Plan.

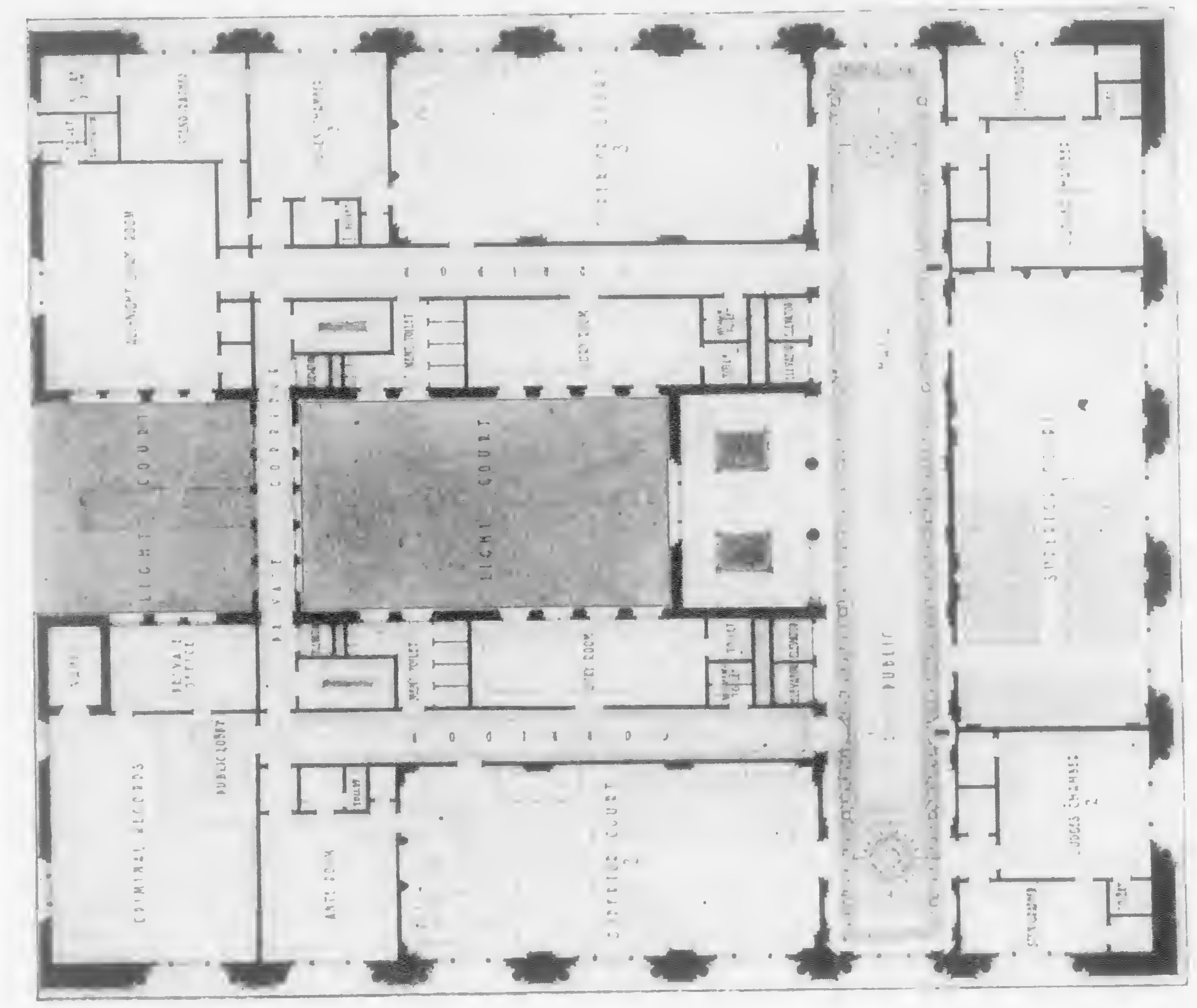


First Floor Plan

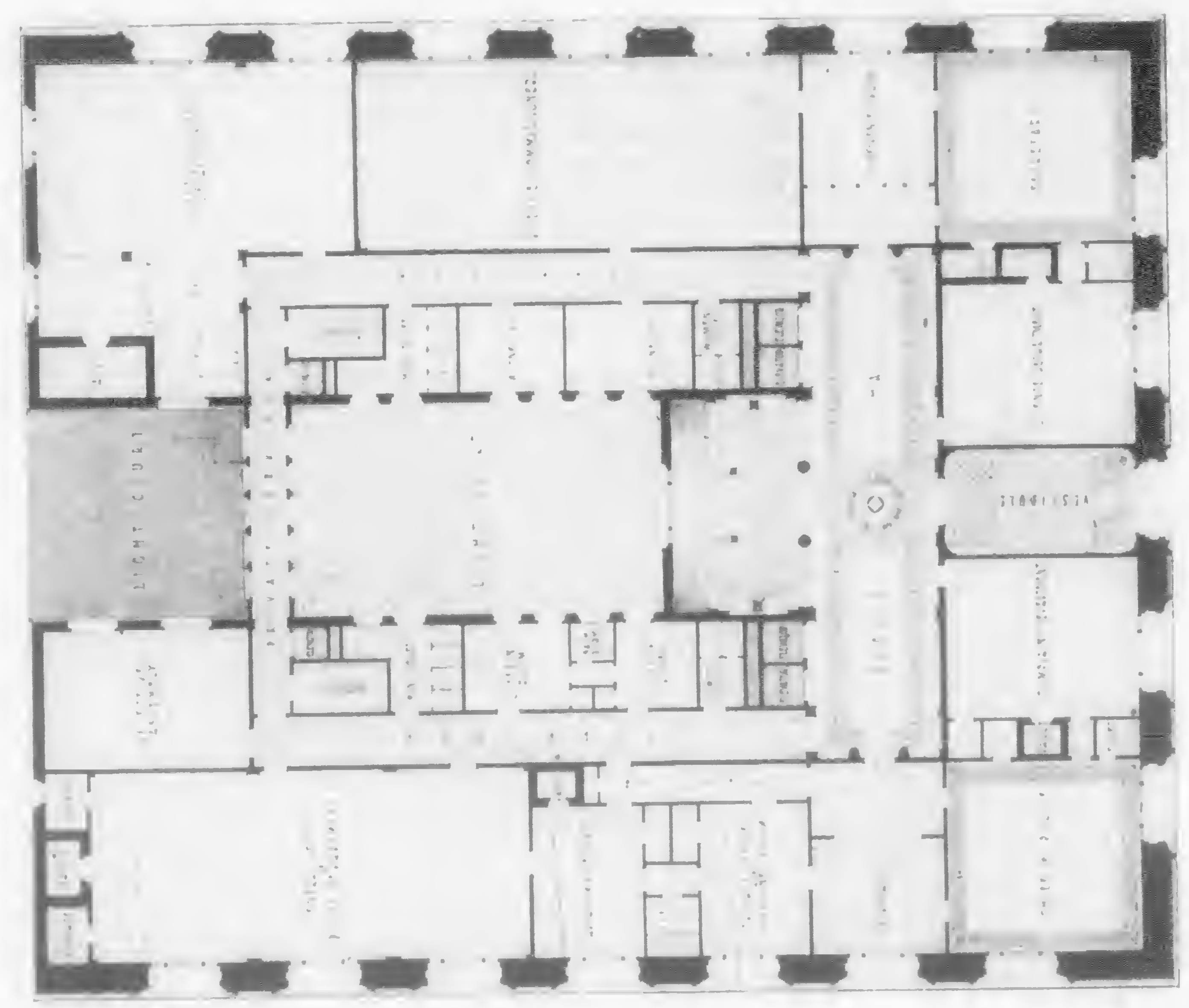
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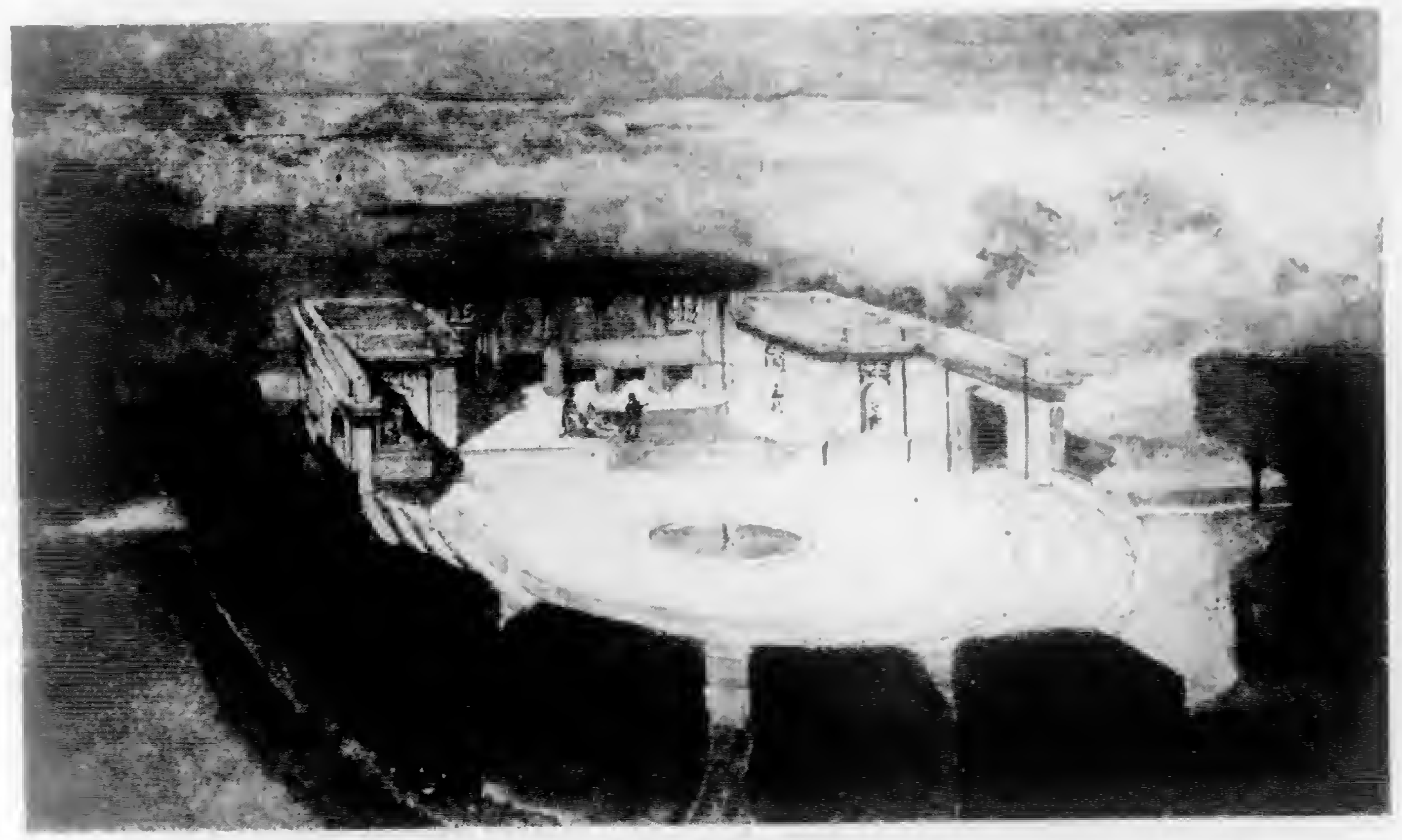


Third-Floor Plan.

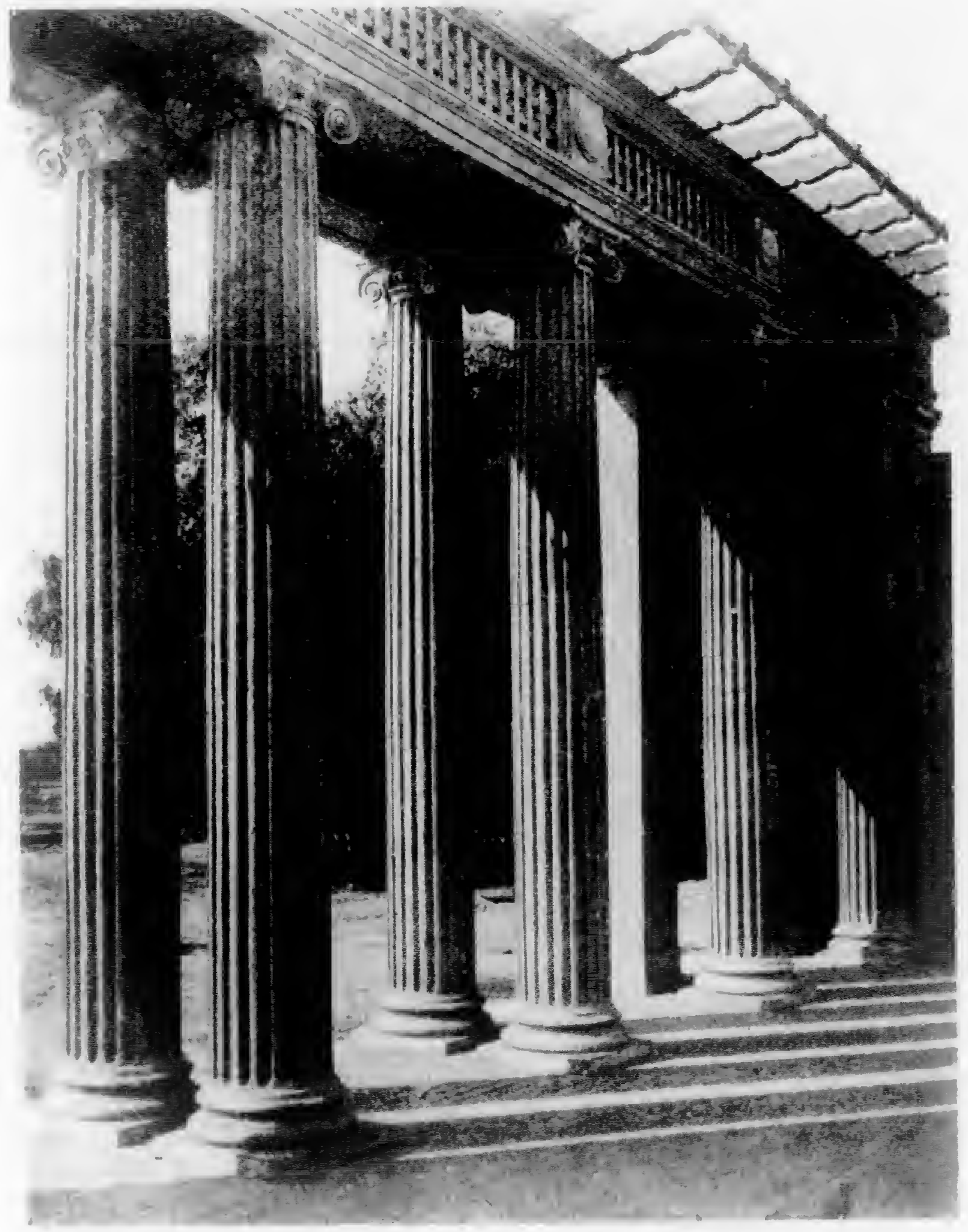


First Floor Plan

Hall of Justice, San Francisco



Perspective of Open Air Theater for Mr. Truxton Beale, Bakersfield, Cal.
Louis P. Hobart, Architect



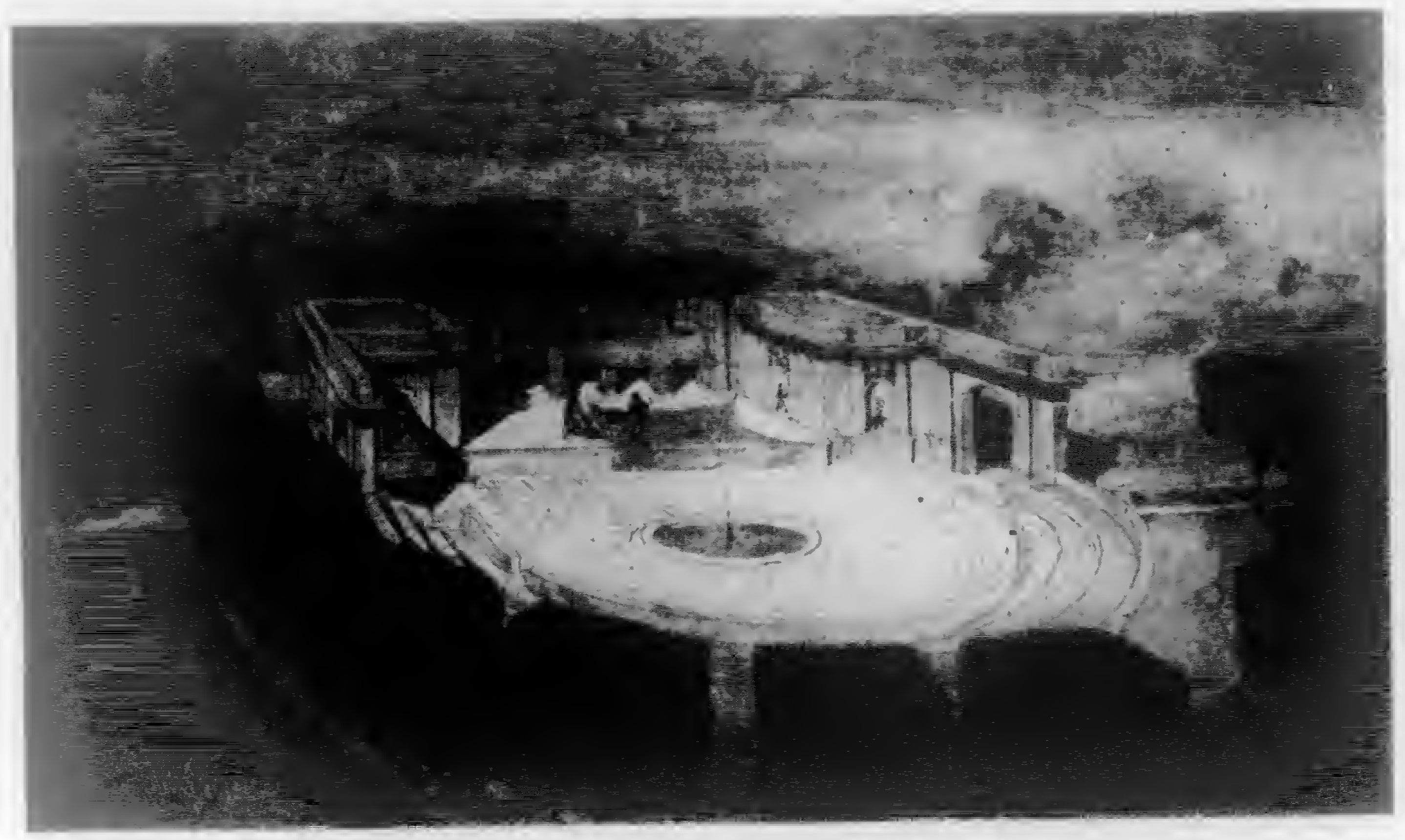
Detail of Colonnade, Open Air Theater for Mr. Truxton Beale.



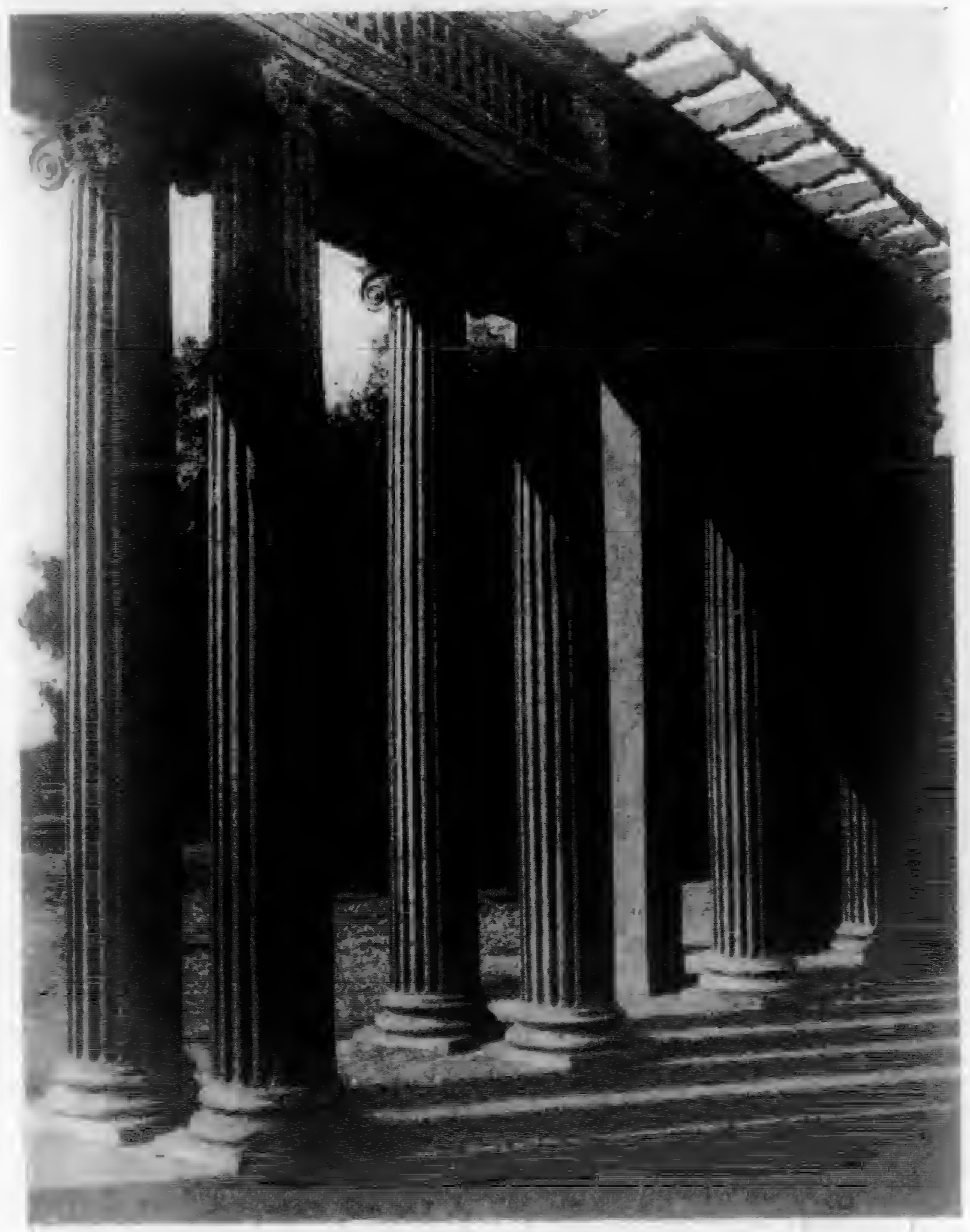
Detail of Entrance, Open Air Theater for Mr. Truxton Beale

Mr. Disi's interior designs were all splendid in their technique, color, design and presentation. We should compliment ourselves on having with us in this city of San Francisco a man of Mr. Disi's ability. Haig Patigan's "Ancient History" certainly deserved a place of honor, and it is to be regretted that other sculptors did not join with us in this exhibition. Mr. Calder of Los Angeles exhibited some interesting sculpture. Mr. Isador Conti's sculpture of a festival frieze was an improvement on Donodatolo's dancing and singing girls, from which it is quite evident he was inspired. In the line of the allied arts The Enos Company, Bauer Fixture Company, Harry Hopps, J. E. Mackay and many others exhibited splendid examples of their art. As to furniture, Sloane, the City of Paris, Baumgarten and others added their artistic effects to relieve the monotonous number of pictures. Sarsi's garden seats were delightful, and Manetta's model of the St. Francis showed exceptional skill for which this clever modeler is noted. It wouldn't be doing the exhibition justice unless we congratulated Paul Elder for his beautiful display of book plates and likewise we must mention Mr. A. R. Widdowson, who represents the Bromsgroove Gild of England, who displayed among other things the statuette of Jeanne d'Arc, an especially interesting, clean-cut and well modeled conception.

The attendance at the exhibition and the interest taken in the same by every one tends to show that the local public is reaching a more appreciative stage toward art and architecture. The comparison of the local work with the eastern more than demonstrates that we have as good talent along our shores as on the eastern coast; so with a keener appreciation of good art and architecture by the general public, with its willingness to sacrifice some commercialism to its noble cause, San Francisco bids fair to become the center of a pure, original architecture expressive of her people as well as the great metropolis of our country.



Perspective of Open Air Theater for Mr. Truxton Beale, Bakersfield, Cal. Louis P. Hobart, Architect



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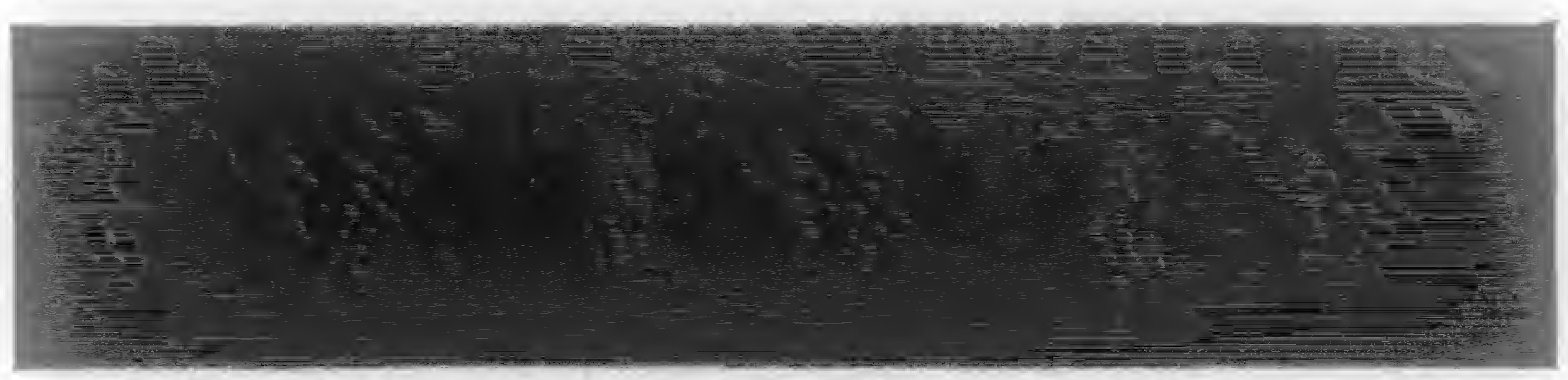
Ship Panel

The Origin and Development of Architectural Faience and Tiles

By FRANCIS G. PLANT*



AMONG the materials being used today for the decoration of architecture of all kinds there is nothing that offers so many possibilities for variety and permanently beautiful effects as the use of glazed faience and tiles. To most people glazed tiles are somewhat familiar objects, but to them the word "faience" is a conundrum. Perhaps a little explanation of both words will help my readers to more clearly follow this article. In simple language, a glazed tile is a slice of terra cotta (or burnt clay) with its face coated with glaze (or liquid glass). Faience is the same material put into more elaborate form, and the growth from the one to the other dates back to the early ages. At first men fashioned objects of coarse, raw clay and crude in form. These were hardened by drying in the sun. They then took to decorating them with scratched lines. The next development was to harden these objects by baking, and from then the next stage was to make the work more permanent by coating it with a thin glaze which they made from such materials as they were acquainted with at the time. From then on throughout the long ages the work developed, and although there have been various accounts of the making of tiles at very early periods, some of them dating as far back as 5000 B. C., it is generally accepted that the Egyptians first used them to any great extent about 1400 B. C. They then employed them in decoration, but the next step was to make them thicker in the form of glazed bricks, and with these they built and decorated many of their palaces and tombs. The Persians acquired the industry from the Egyptians



Grape Vine Panel

*Art Director the Hartford Faience Company.

and produced some marvelous examples of colored glazes that have never since been excelled.

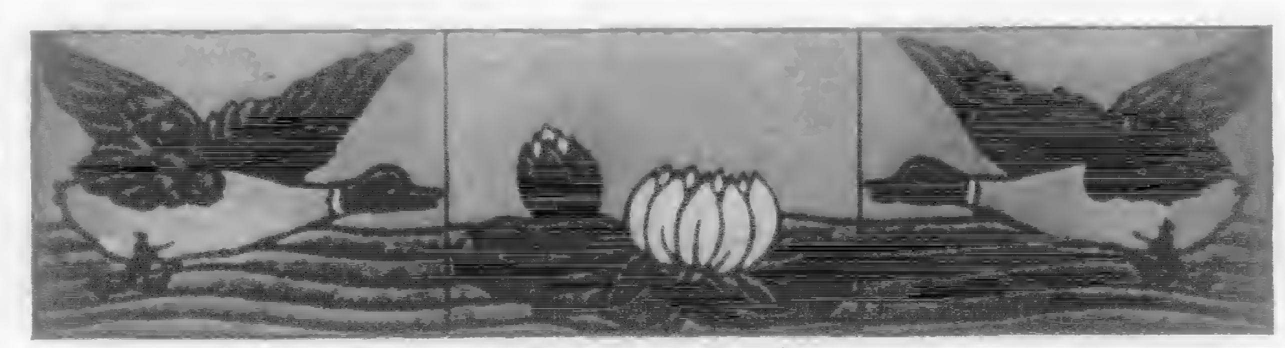
From the Persians the work was taken up by the Arabs, and this wild race of people proved by their masterly handling of the material that art was a part of their nature. The invasion of the Spanish Peninsula by the Arabs in 1711 A. D. marked the entry of the industry into Spain and it was extensively practiced there. The famous Alhambra was commenced in the year 1272 A. D. and the tiles that decorate it are among the most beautiful that have ever been produced in any age.

During all these periods there were various attempts to develop burnt and glazed clay in the direction of differently shaped pieces for architectural construction and decoration, but it was not until the fifteenth century that any great note was struck in this direction. About that time it was extensively produced by Italian workers and factories were established at Faenza and in the surrounding neighborhood. The most brilliant of these workers were the Della Robbias, and this family manufactured various objects in burnt and glazed clay for the decoration of buildings. It was at this time that the word "faience" came into general use, presumably from the fact that the material used in the Della Robbia productions were similar to what had been used before at Faenza.



The Owl

To fully describe the work of the Della Robbias would take considerable time and space, but their genius was so great and gained such fame that any writing on tile and faience would be incomplete without a brief description of what they did. The senior and most famous Della Robbia was Luca, who was born at Firenze about the year 1400 A. D. Before he adopted faience as a means of carrying out his ideas he executed marvelous work in carved marble and moulded bronze. He first employed faience about the year 1440 A. D. and his first finished work was a tabernacle for the Chapel of St. Luke in the Hospital of Santa Maria Nuova, Florence. Some of his most important works are to be found in the little village of Impruneta, six miles from Florence. There is kept the wonderful image of the Virgin which in times of pestilence or calamity it was customary to carry in procession to Florence. Luca's works in glazed faience have technical qualities which have never been surpassed. In the first place, he used a clay that was well selected, washed and freed from all impurities; secondly, he employed glazes which were pure and beautiful in color, and predominant among these was a magnificent pale blue and a creamy white; thirdly, his works had the glaze evenly distributed over the whole surface and so preserved the beauty of his modeling; fourthly, he was extremely careful in the jointing of different pieces and he always fitted them together and eliminated all ragged edges and coarse joints. The next Della Robbia of note was Andrea, Luca's nephew, who was born in the year 1435. During his early years he was assistant to his uncle, Luca, and although



The Duck Panel



Wall Fountain.



South Ferry Panel.



Conservatory Seat and Floor.



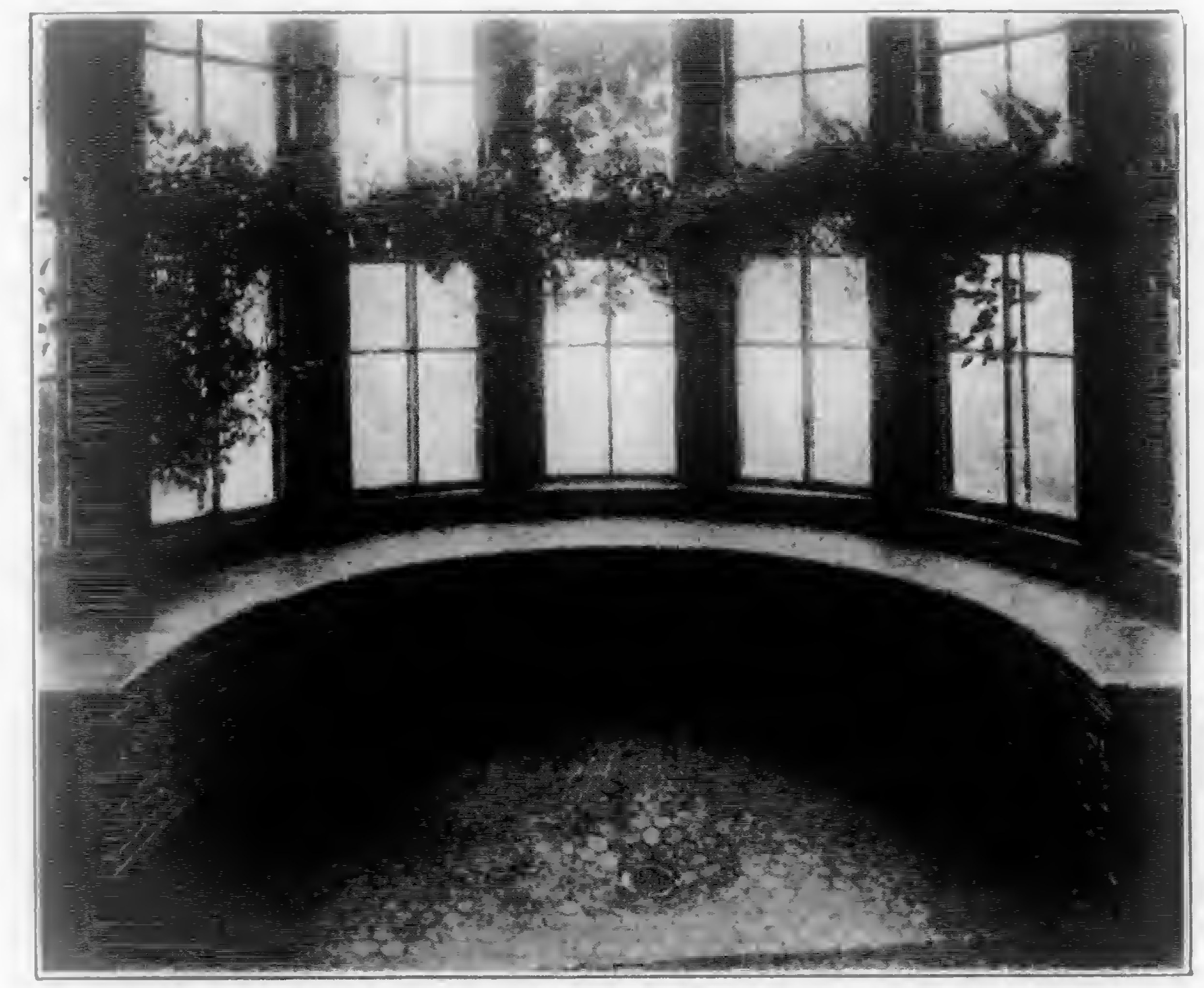
Charter Oak Mantel.



Wall Fountain.



South Ferry Panel.



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Charter Oak Mantel.

he was strongly influenced by his uncle he was no imitator, but a conscientious artist who in the expression of art followed lines of his own. His best works are those where he employed the figure of the Virgin, kneeling figures, children and cherubs' heads. In Andrea's later years the decline of the Della Robbia faience began. He employed many assistants who repeated his designs and often executed slovenly work of the poorest quality. In place of the fine, flawless glaze of Luca these assistants drifted to glazes of poor quality which contained coarse specks of grit, bubbles and flaws. The degradation of the



Faience Mantel, "The Sun Worshipers"

Della Robbia art was complete when one of Andrea's sons, Giovanni, commenced to supply a popular commercial demand for reproductions of his father's work. Further than this, he commenced a series of imitation loud in color, and by the time he had ceased these imitations he had drifted to crude work, and his lack of sincerity led him at a later period to substitute oil paint for glaze. His one object seems to have been to obtain striking effects with as little genuine labor as possible. In spite of all these failings he at times

produced works which proved that, if he had used it rightly, he had some of the fine ability possessed by Andrea and Luca. Giovanni died in the year 1529 A. D. and, except for a younger brother, Girolano, who spent most of his time working in France, the actual connection of the Della Robbias with faience ends. From that time onward the word faience seems to have always been employed when describing architectural objects of clay, burnt and glazed. The various periods of the use of faience and tiles from the time of the Della Robbias until the present has been marked with many changes, but all the time the industry has been actively practiced in nearly all European countries, particularly England, France, Holland and Germany.

In various parts of these countries there are magnificent buildings which are standing illustrations of the possibilities of the material, and after its varied journey throughout the many ages it seems at the present time that the manufacture of high-class faience and tiles is about to enjoy the success it so richly deserves. Such great firms as the Doultons of England have already achieved world-wide renown in its production, and it is probably due to them and other famous European firms that the manufacture of the material was introduced to this country. Many of the leading men in the industry here to-day received their earlier training abroad.

Tiles were first manufactured here about thirty-three years ago, but faience was not commenced till about 1890. At first it was hardly appreciated, or if appreciated was little encouraged. As time went on, however, owing to the enthusiasm and tenacity of the one or two firms engaged on the work, it began to take hold, and so it has grown until at the present time it is a thriving business. Foremost among these pioneers should be mentioned the name of the Hartford Faience Company. From the commencement of the industry here they have fought the various problems and endeavored to produce something which was worthy to rank with older exponents abroad. That they have been successful in no small measure is proved by their being awarded at the St. Louis Exposition the gold medal for a faience mantel about 10 feet 6 inches by 10 feet 6 inches, entitled "The Sun Worshipers" and executed in the Della Robbian style. This work was pronounced by expert critics to be the most ambitious piece of faience ever executed in this country.

In addition to the decorative value of faience and tile it has been conclusively proved that it possesses better fireproof and sanitary qualities than any other building material except the hard stones such as marble and granite which are considerably more expensive, and even these are not perfect. Brick and unglazed terra cotta get filthy in time, marble requires repolishing, granite endures, but unless it be polished soon becomes grimy; but faience owing to its glazed surface and color, loses little brilliancy, however severe the climate may be. Then it has another virtue: besides being easily cleaned and brightened by rain it also, owing to its coating of glaze, protects the walls of a building from dampness.

After a very heavy rainstorm a brick or concrete wall has an immense amount of water to be vaporized before it can become dry and warm, and the weight of this water is considerable. Good faience and tile work is absolutely permanent, and there is no better testimony of this than the magnificent examples of Egyptian and Italian work that to-day are almost as perfect as when they were produced. In America perhaps more than any other country in the world, "More beauty in our buildings!" seems to be the cry, and, fortunately, the architects are realizing that with the possibilities of faience and tile they can combine strength of construction with beauty of form and color. There is no reason why, given proper study in design and manufacture, results cannot be obtained to equal those of the old masters. With the exception of more scientific machinery in the preparation and mixing

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of the clay and glazes, the work is made and fired to-day just as it was done by the ancients, and the following is a brief description of the manufacture of a piece of faience or tile from the raw clay to the finished state:

Different clays are dug from the earth and dried, ground and mixed together with sand, flint or feldspar. The mixture is then sieved and stirred with water to form a plastic clay which is called the "body." This clay is then pressed into moulds or worked with the hands to form the desired shape, which is then dried slowly until it becomes what is known as "white hard." It is then put into a kiln or oven and baked at white heat for about fifty hours. The kiln is allowed to cool, and the material taken from it is known as "bisque." This bisque is then coated with glaze or liquid glass which at this stage is in a form similar to thick cream. If the work has an elaborate design on it or is otherwise of a high class the glaze is applied by an artist.

As soon as the glaze paste is dry the work is put into another kiln and baked again about another fifty hours. This second baking causes the properties in the glaze to melt or "flux" together and so forms a thin coating of glass wherever it is applied. The work when taken from this kiln is like colored stone with about one-sixteenth of an inch of glaze on the face of it, and this glaze may be either bright surface or "matt" like the grain of an eggshell. This is the finished stage, and the material is then ready to be set on the building. It may be either in large blocks for constructional purposes or flat, as tiles or panels, for decoration of stone, brick or concrete buildings. One of the most important points in connection with the work is the magnificent range of color which can be had. Hitherto the cry against color on our buildings has been because it was claimed that there was too much smoke and dirt and the color would soon be lost. We are getting over the fallacy, however, and the more eminent of our architects are fearlessly using color and yet exercising the proper amount of restraint to avoid vulgarity. This courage is giving to us such beautiful buildings as the Brooklyn Academy of Music and Dr. Parkhurst's church, and there are more to come.



Tree and Mountain Panel

Unique Reinforced Concrete Bridge*

By EDWARD L. MAYBERRY, C. E.†

Spanning the Arroyo Seco, at the west end of Colorado street in Pasadena, Cal., is a new reinforced concrete bridge that is both novel and interesting, and one that marks a change in the conception and use of this material for bridge work. The prevailing idea of the use of concrete for bridge building has been that of low, short girder spans or some form of arch construction. Although there is no better construction than the latter type, it is expensive, especially for long and high spans, and on account of its high initial cost, cheaper materials are frequently employed.

THE site of the Linda Vista bridge was an ideal one for the arch form of construction, but cost was the main factor in deciding what type would be used. The engineers had the problem of designing a bridge in accordance with certain specifications and a limited amount of money. Knowing that the viaduct type, long girders carried by towers, would be the cheapest form to use in steel construction, it was decided to investigate this type for a reinforced concrete structure, even though it had never been used before for a highway bridge. There are two instances where viaducts of a somewhat similar design have been built. One is a railway viaduct erected in 1907 for the Richmond & Chesapeake Bay Railway Company, in Virginia, and the other a highway bridge across Sligo Branch in Takoma Park, Indiana, built this year. Whereas, the first is a reinforced concrete viaduct, the second cannot strictly be classed as such, for structural steel girders and column struts were used in its design.

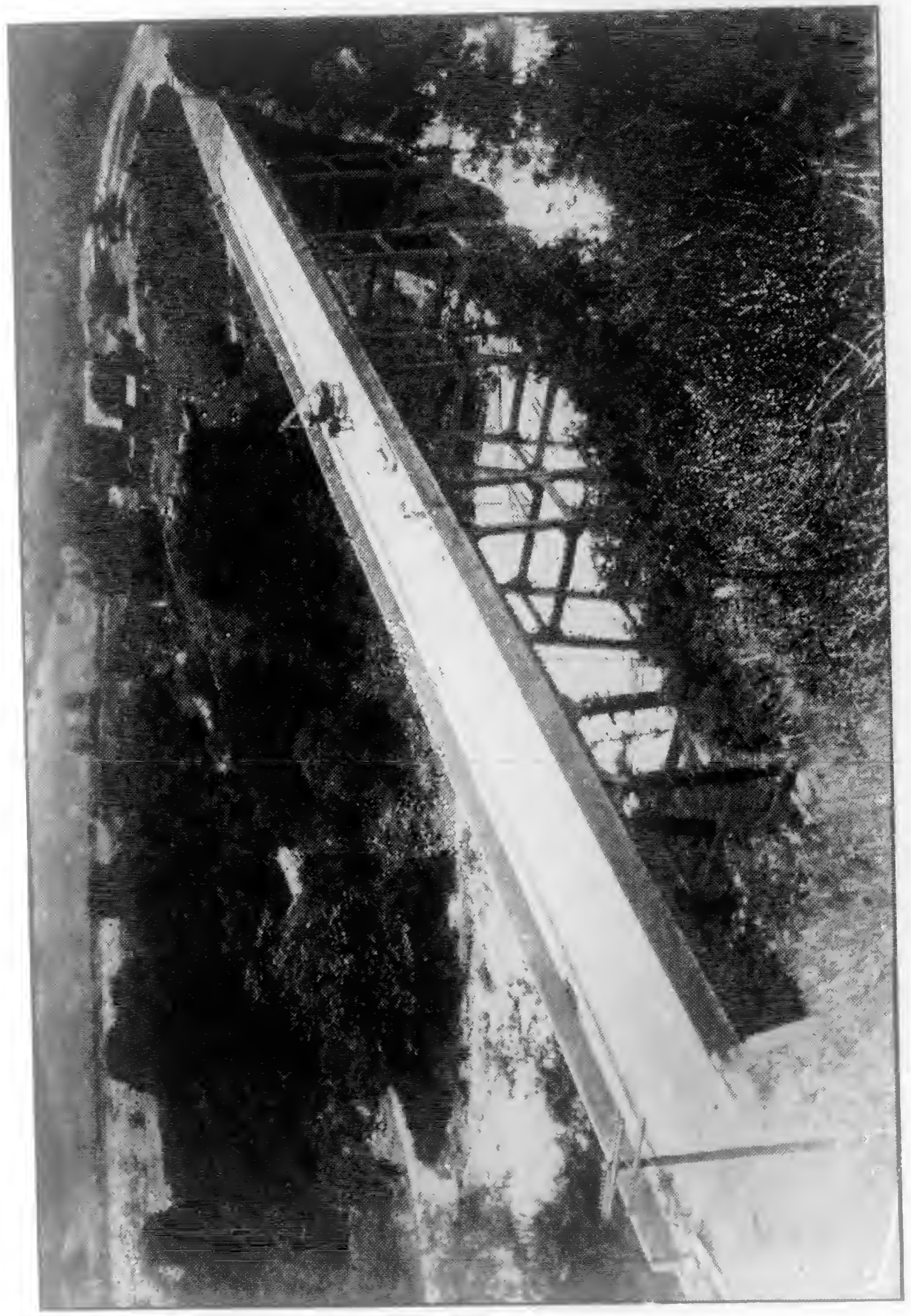
The general specifications for this bridge called for a structure 400 feet long with a twenty foot roadway designed to carry a twenty-ton roller, and at an elevation four feet higher than the former bridge, or some 65 feet above the bed of the river. After a careful study of the bridge site and trying several schemes, the viaduct type of construction was adopted, using five tower and six girder spans. This arrangement spanned the active bed of the stream best and gave a uniform panel spacing of 17′-3″ throughout the length of the bridge, using one panel to each tower bent and three panels for each girder span. They then had girders 51′-9″ long supported by towers 17′-3″x20′-0″ at the top, the tower columns having a batter of one in ten, in the transverse direction of the bridge.

There had existed and been in use for some twenty years an old wooden structure consisting of two truss spans of about 130 feet each with trestle approaches at each end. On account of the great height of this bridge and the necessary high cost of scaffolding to support the reinforced concrete structure during its construction, the engineers planned to use this old wooden bridge, temporarily strengthening the same where necessary, for a working platform and staging to erect and help carry the new structure. In order to utilize the old bridge, the engineers made their design so that the new structure would straddle the old trusses and the final plans gave a twenty-foot clear roadway between curbs, with four foot sidewalks on each side.

Although the Arroyo Seco, as its name implies, is a dry stream nine months in the year, during the rainy season, there are periods when a large volume of water, at times six feet deep with considerable velocity,

*Illustrations by courtesy of the Southwest Contractor and Manufacturer.

†Member of the firm of Mayberry & Parker, Architectural Engineers, Pacific Electric Building, Los Angeles.



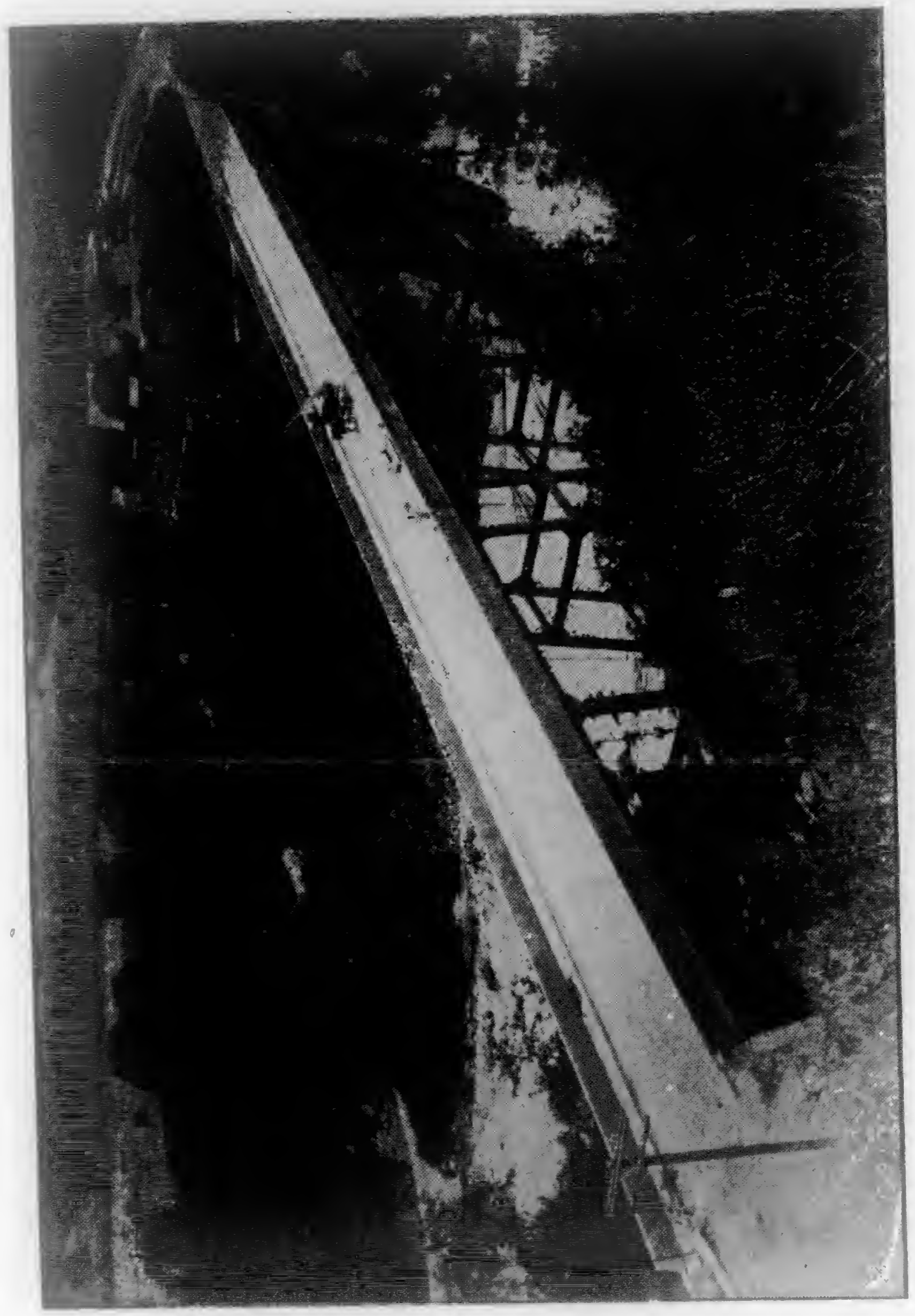
Linda Vista Reinforced Concrete Bridge, Pasadena, Cal.
Mayberry & Parker, Engineers

has to be taken care of. A reinforced concrete bridge is one that is built for all time, and so it was necessary to carry the foundations of this bridge deep enough to preclude the possibility of a remote chance of their being undermined. In view of the fact that this stream carries but little drift, it was feasible to use isolated pier footings under these towers. These footings extended from a level of some eight feet above the lowest point in the river bed to from ten to sixteen feet below this point. They are six feet square at the bottom and three feet square on top, there being four to each tower or one for each column.

On excavating for these footings considerable water was encountered, being the underflow of the stream, and on two of the central towers the contractors were obliged to pump day and night to keep down the water level. Even then it was not possible to entirely pump the crib dry with the available plant, and it became necessary to deposit concrete under water. This was done with a tremie, or long tube with a hopper at the upper end, that permits of placing the concrete in mass on the bottom of the excavation without the aggregate being separated and the cement washed out by passing through the water. The work of putting in these pier footings was pushed rapidly and concrete deposited continuously in order to get above the water level, and was perfectly successful. All of the footings for the three central towers were completed before any of the superstructure was commenced, as the winter season was at hand and the contractors were anxious to get above high water with the work as soon as possible. As intimated, the towers consisted of four columns each. These columns are eighteen inches square and reinforced with 8-1¼″ round steel bars extending into the pier footings to within one foot of their base. Nearly all of the columns are over fifty feet long and have longitudinal and transverse struts framing into their third points to stiffen them. The struts vary in size from 10″x18″ to 12″x24″ and are reinforced with 4-⅞″ or 4-1″ twisted steel bars laced as a column. Large corbels on two sides of the struts reinforced with 2-¾″ twisted steel bars form knee braces and materially aid in producing a rigid connection.

The deck consists of a reinforced concrete slab, longitudinal stringers, transverse deck beams and girders. The stringers are 17′-3″ long and 6′-0″ on centers with a cross section of 7″x19½″ and reinforced with four 1″ twisted steel bars. The deck beams between the large girders have a cross section of 10″x25½″ and are reinforced with 6-1⅛″ twisted steel bars. In the tower spans these transverse beams were increased to 12″x30″ to add lateral stiffness. The large girders 51′-9″ long, extending from tower to tower have a cross section of 16″x58½″ and are reinforced with 9-1⅜″ twisted steel bars in tension and 3-1⅜″ round steel bars in compression. In the tower bend the longitudinal girders are the same size as the fifty foot girders and are reinforced with 4-1″ twisted steel bars. Corbels were used on the longitudinal girders and shear bars and stirrups were provided to care for all stresses. The sidewalk is carried by small cantilever beams or brackets at every panel point, on the outside of the large girders. The rail is a 4″ reinforced concrete slab designed as a cantilever. The truss form of reinforcement, that is, bending up a part of the tension steel over the supports to care for the reverse stresses obtained at those points was used throughout.

Owing to the length of this bridge it was necessary to provide joints to take care of the expansion and contraction that takes place in the concrete due to changes in temperature, and the structure, therefore, is cut



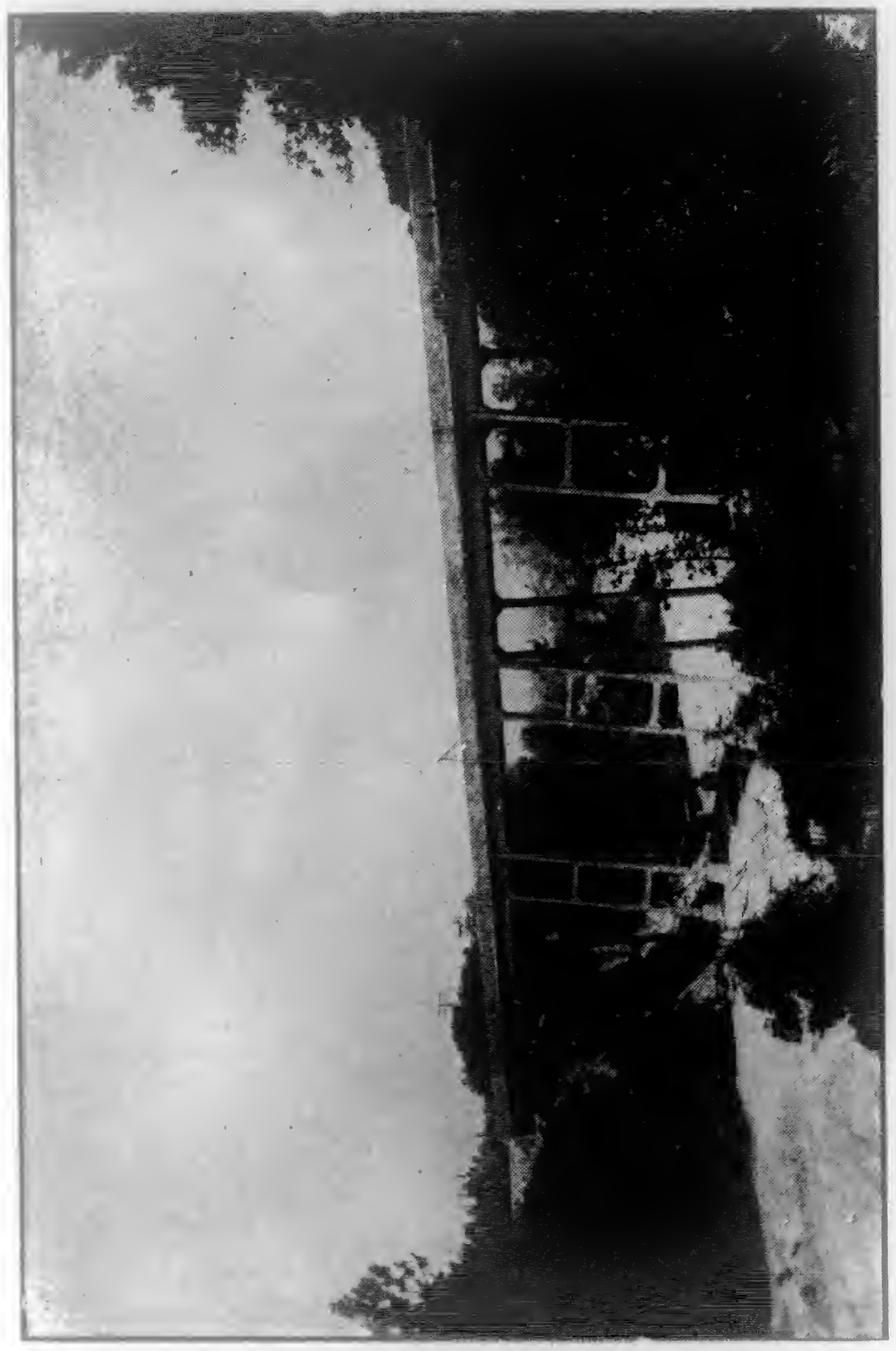
Linda Vista Reinforced Concrete Bridge, Pasadena, Cal.
Mayberry & Parker, Engineers

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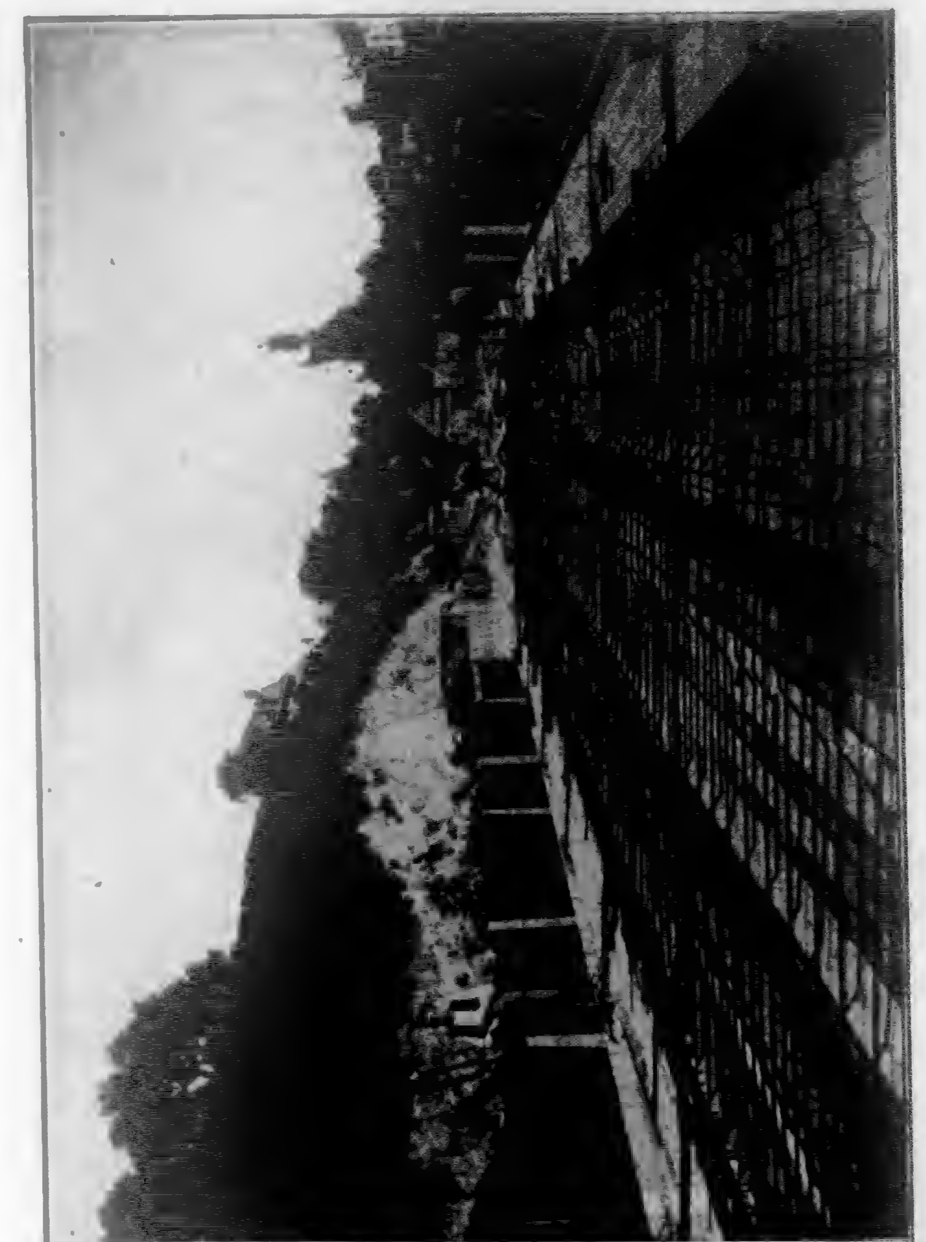
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Linda Vista Bridge, Looking Up Stream
Mayberry & Parker, Engineers

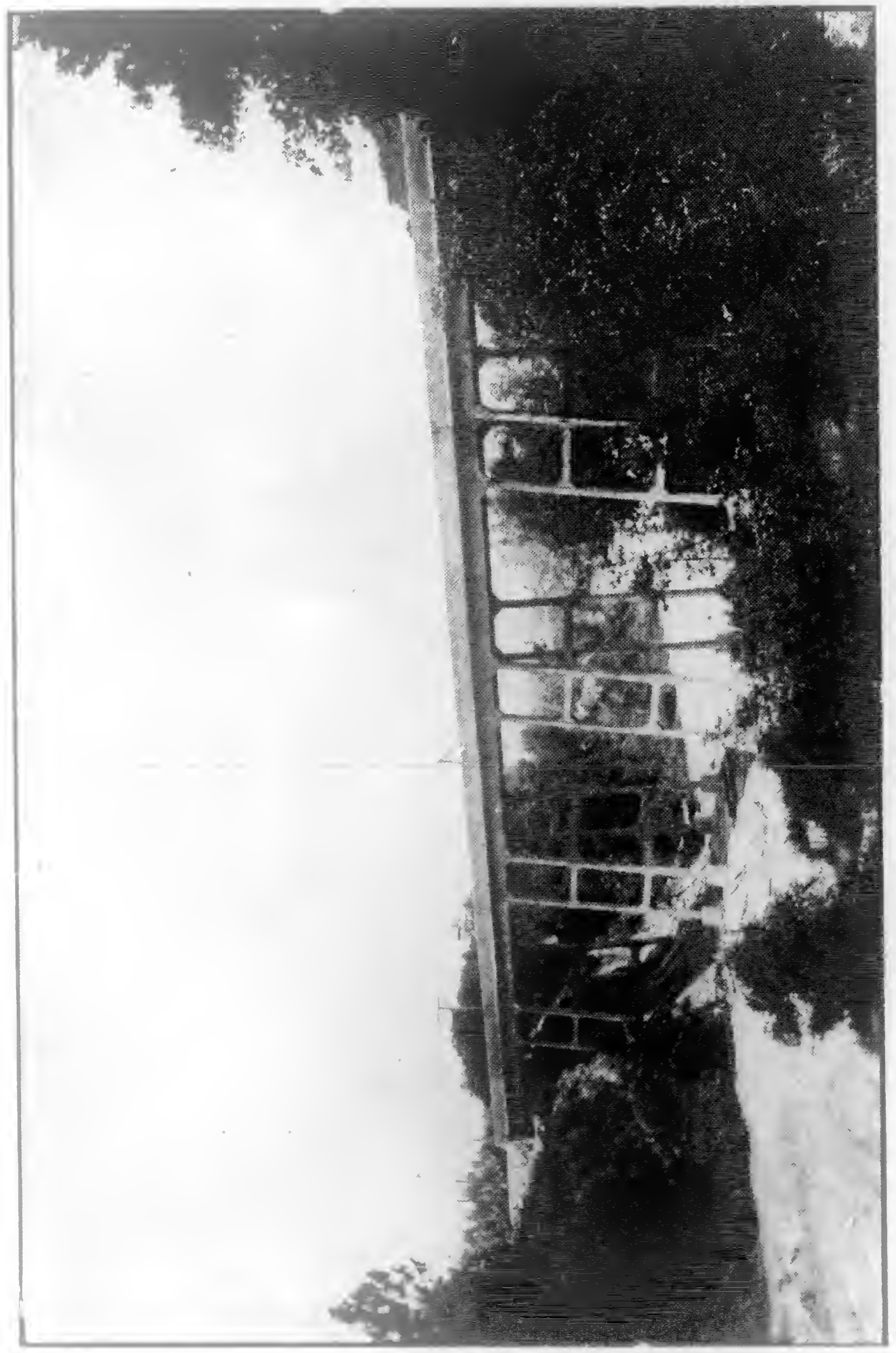


Forms and Reinforcement in Place for Roadway

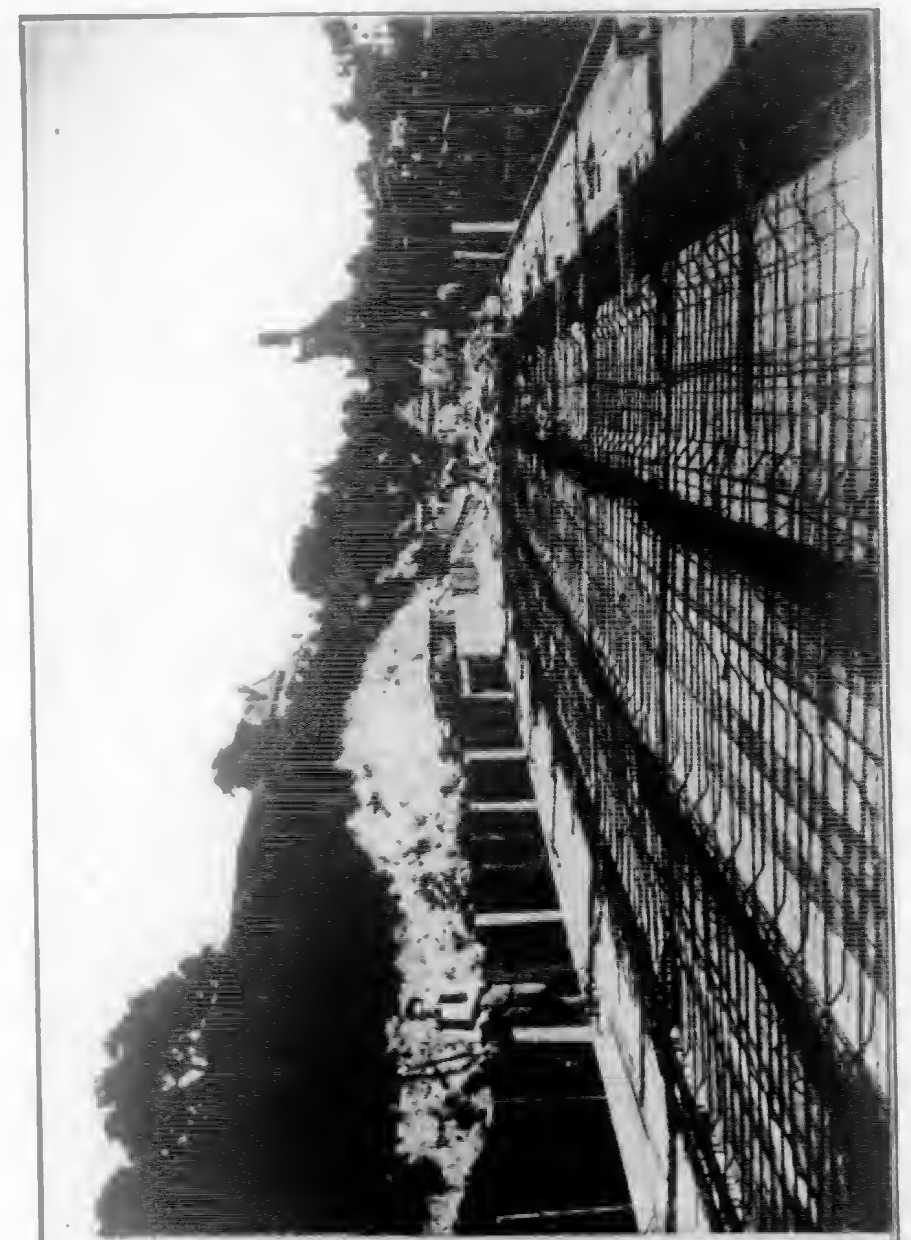


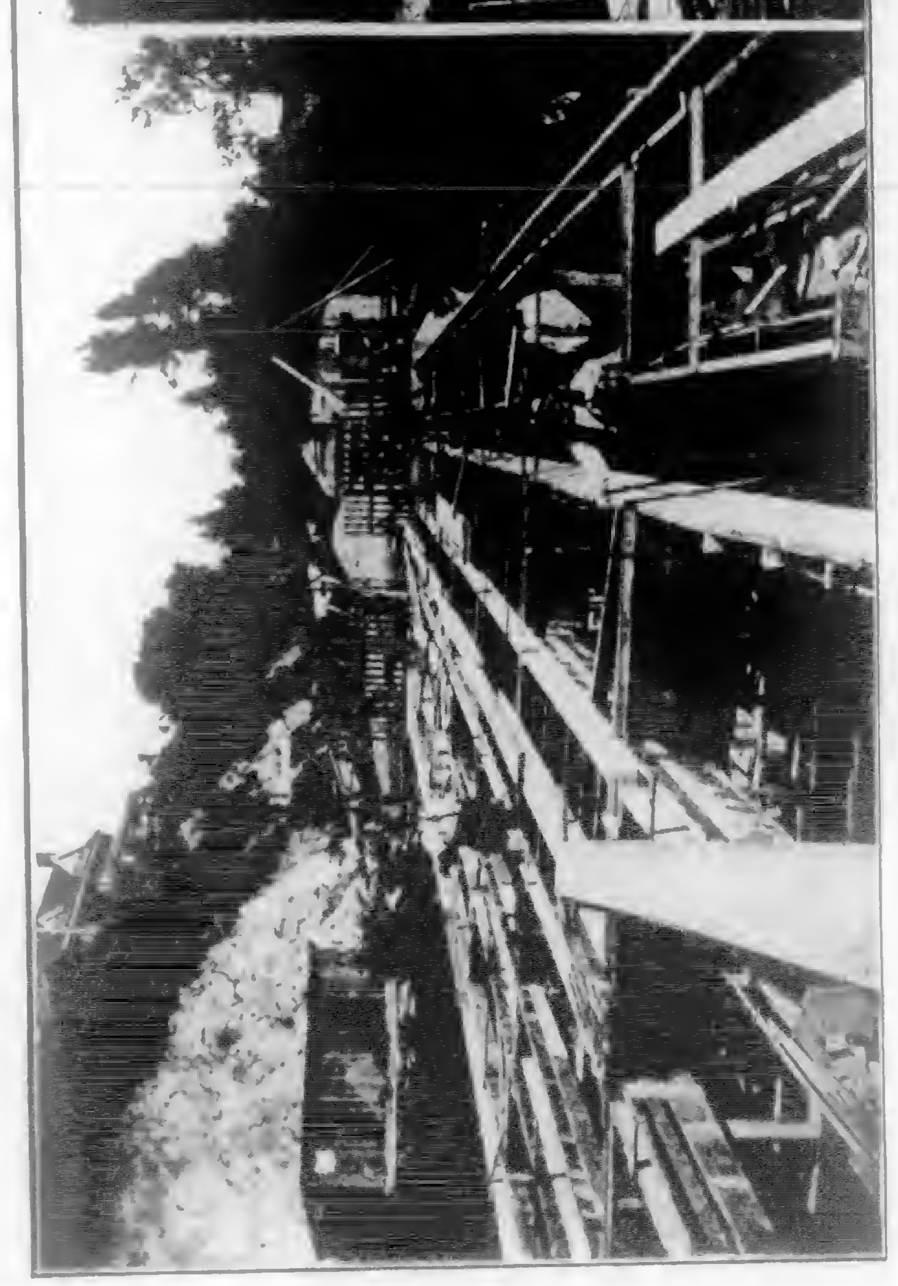
Showing Depth of Girders

Linda Vista Bridge, Pasadena, Cal.



Linda Vista Bridge, Looking Up Stream
Mayberry & Parker, Engineers





Showing Depth of Girders — Farms and Reinforcement in Place for Roadway

Linda Vista Bridge, Pasadena, Cal.

entirely into at two points. The expansion joints are on the outer ends of the portion consisting of the three central towers with their two connecting girder spans, and can be seen by a close inspection of the accompanying photograph. This facilitated construction, also, as it enabled the contractor to erect and complete this central portion of the bridge, remove a portion of the forms from the same and use them in turn on the west and east sections, which consist of a single tower and two girder spans.

The whole structure was given a pebble dash finish of cement on the outside and the sidewalks were trowelled smooth and blocked off. An eight inch cement curb, with angle guard, separates the roadway from the sidewalks and galvanized iron conduits are set in this curb at stated intervals, so as to effectively drain both. The roadway was given a two inch asphalt wearing surface.

It will readily be seen from the above and from a study of the photographs reproduced here that no attempt at ornament has been made in the design of this structure and that art was sacrificed to utility in order to eliminate extra cost. Nevertheless the bridge as completed presents a very pleasing aspect and is beautiful in its very simplicity reflecting considerable credit upon the designing engineers for the good proportions maintained in the design and upon the contractors for the excellence of their work.

Although this bridge was designed for a twenty-ton roller, there was none available when it came time to make the required test. The heaviest roller obtainable weighed fourteen tons. This roller was run across the bridge several times in order to thoroughly test all parts of the structure. Observations were made as to the amount of deflection on each of the big girders on both sides of the bridge, the roller being brought to a stop at the center of each girder and readings taken. The maximum deflection in any girder was only $^1/_{1200}$ of the span, which was more than satisfactory to all parties interested and demonstrated that the structure is perfectly able to carry a much heavier load than the twenty-ton roller, for which it was designed, with absolute safety.

This test was a very severe one upon the deck slab in view of the fact that with the twenty-ton roller, under specified loading, there would have been an uniformly distributed load over seven feet of 3800 pounds per transverse foot on this slab, whereas the fourteen-ton roller had rear wheels only 20 inches wide, giving a load of 9,500 pounds concentrated on twenty inches or 5,700 pounds per transverse foot of roller. This will be further emphasized when it is stated that a concentrated load produces double the effect of an uniformly distributed load and comparing the loads given above, it will be seen that this test was nearly three times the load for which this slab was designed. There was no evidence or indication of possible overstress at any time during the test, which was witnessed by and made under the supervision of the County of Los Angeles, represented by its County Surveyor, Mr. Noble; the City of Pasadena, represented by the acting Mayor, Mr. Hotaling and its City Engineer, Mr. Van Ornum; the designing and supervising engineers, Mayberry & Parker, of Los Angeles, the contractors, the J. F. Hall-Martin Construction Company of Los Angeles and others.

In conclusion it might be well to say that a competing design for this bridge was submitted and consisted of a steel viaduct some twenty feet shorter, with wooden floor, joist, deck and rail. Bids were called for on both plans and the lowest bid for the reinforced concrete structure was only $3,700 more than the lowest bid for the wood and steel bridge. The reinforced concrete bridge is, of course, a permanent structure with practically no cost of maintenance and was designed to carry a load 50 per cent greater than the wood and steel bridge. The total cost of this bridge, including engineering and inspection fee, was $22,054.67 and, when its length and height are kept in mind, is a fine showing for a reinforced concrete bridge, being only $1.95 per surface foot of road-way and side-walk.

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Is Concrete Good for Everything?

ABOUT everything except wearing apparel and table utensils is now made of reinforced concrete. The use of this material has taken on the qualities and dimensions of a fad—one of those accesses of temporary mania to which the great American public is subject. Sometimes it is roller skating, sometimes bicycling; just now it appears to be concrete. Without prejudice to the undoubted advantages of this compound as a building material it may be foretold that some few objects made of other substances will remain to us. In the last few years the enthusiasts have begun to build highway bridges of reinforced concrete floor slabs on account of their permanence, rigidity and steadiness. Apparently some of the designers forgot that with these advantages goes increased weight, and the road builders, coming after them, have made the matter worse by loading these structures with macadam. Result—collapse. Within three months two new bridges have given way from this cause, one of which was not quite completed. In one case the contractor, wishing to give good measure, made his floor eight inches thick instead of six, so that when the bridge was turned over to the authorities it was already overloaded by 25 pounds to the square foot. Then the road gang, who appear to have been equally lavish and generous, built up the macadam 12 inches thick at the crown, whereas the plan called for a uniform three inch layer. This added 40 pounds overweight a square foot, a total of 65. As the total provision for "live load" was only 100 pounds to the square foot it is not to be wondered at that the first heavy load brought the bridge down. English engineers charge that the Americans do not know how to build large bridges safely.—Chronicle.

* * *

San Francisco Temporary Buildings Must Come Down

INSPECTORS from the San Francisco Board of Public Works are having a busy and somewhat exciting time visiting the owners of properties in a very large district in San Francisco upon which temporary buildings were erected immediately after the fire of 1906, on permits issued by the then mayor of San Francisco. It seems that no one knows how many buildings are affected by the order of the supervisors that they shall all be demolished or removed on or before May 1, 1910. No record was kept of them. The permit to put up temporary buildings was a measure of expediency to meet an emergency.

Buildings that must be removed were erected in the following streets: East, Steuart, Spear, Main, Beale, Fremont, Drumm, Davis, Front, Battery, Sansome, Montgomery, Kearny, Grant avenue and Dupont, Stockton, Powell, Mason, Jones, Leavenworth, Hyde, Larkin, Polk, Van Ness avenue, Market, Mission, Grove, Fulton, McAllister, Golden Gate avenue, Turk, Eddy, Ellis, O'Farrell, Geary, Post, Sutter, Bush, Pine, California, Sacramento, Clay, Washington, Jackson, Pacific avenue, Commercial, Vallejo, Green, Union, Filbert and Greenwich. Also a number on Franklin and Gough streets.

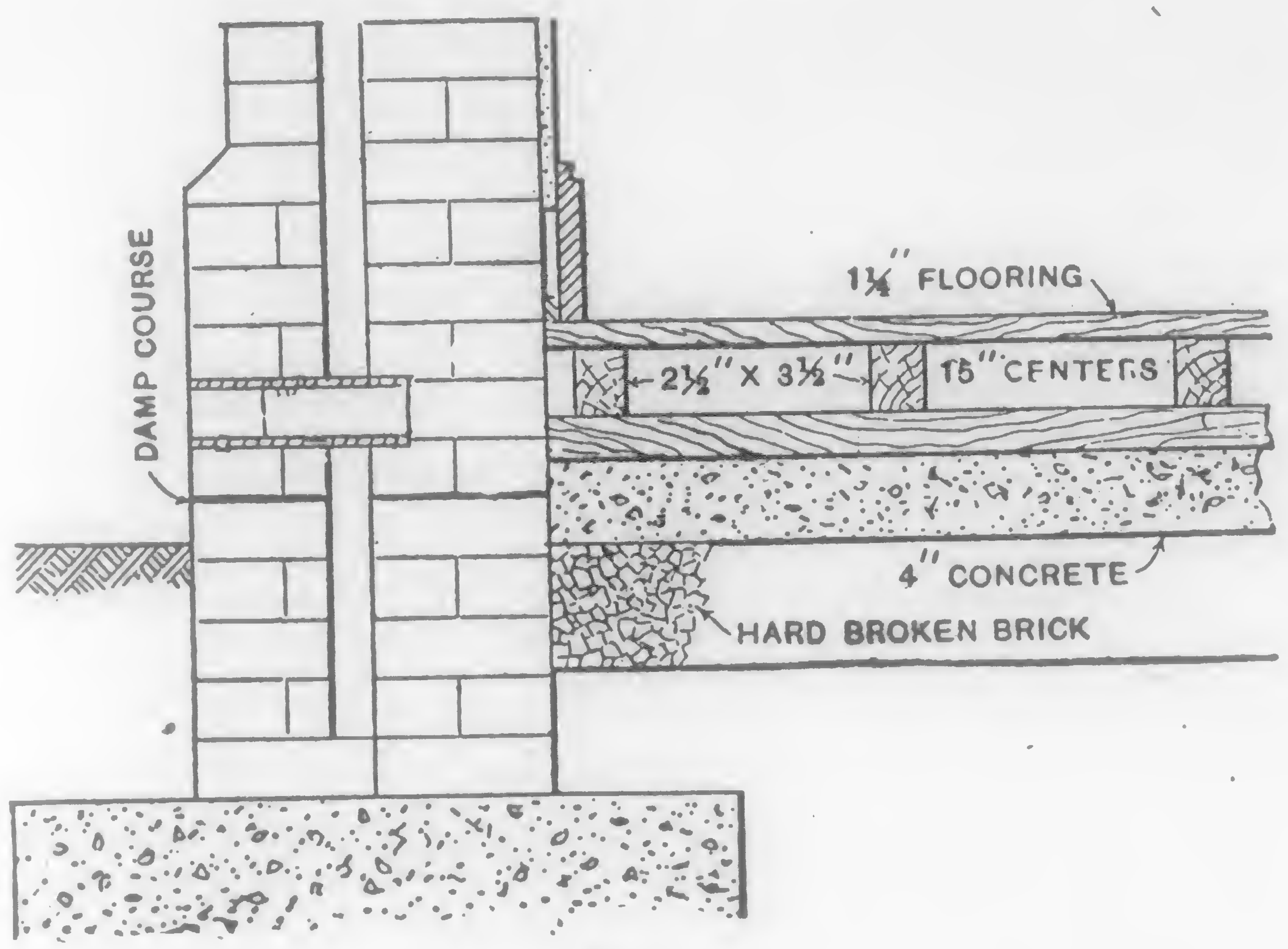


Fig. 1

How to Lay Wood Floors on Concrete Bases

THERE are today in connection with building construction many conditions which call for a concrete floor with a wood finish, as it might be termed; that is, a wood floor laid upon a concrete bed. There are several ways of constructing such a floor, and a London writer gives some valuable information that will come handy to most builders. Floors constructed as here shown are capable of carrying heavy loads with great economy of timber as regards the size of joist to be used.

In the methods described any of the usual joints may be adopted instead of rebated and filleted flooring, while if hardwood is the material the spacing of the joists must be altered to agree with the holes bored for the nails, for hardwood flooring is generally supplied already bored for secret nailing, the holes being at regular intervals.

The following is a description of the floor illustrated in Figs. 1 and 2, the latter being a longitudinal section of the floor shown in the first illustration: Excavate over the area of the building as may be required; then level and prepare the surface and provide and lay hard broken brick rubbish 6 inches thick, free from dirt, chips, shavings and organic matter, to be thoroughly rammed and left even and level on the surface. If a good hard bottom is found upon excavation the broken brick may be dispensed with. Upon this filling provide and lay Portland cement concrete, 4 inches thick, composed of 1 part of cement to 5 parts of clean gravel, shingle or broken stone, ¾ inch gauge, containing just sufficient sand to fill up the interstices, level and tamp until water is brought to the surface, which should be then floated.

The sleeper plates should be of fir, free from defects of every kind, 2 inches by 3 inches, bedded evenly on the layer of concrete referred to above at intervals of 3 feet 6 inches center to center. The joists should be of fir 2½ inches by 3 inches, spaced 1 foot 3 inches, center to center and securely fixed to plates by two 2½ inch wrought iron nails at each support.

The flooring should be in 4½ inch widths, 1¼ inches thick, laid with rebated and filleted joints with splayed headings. Fillets should be

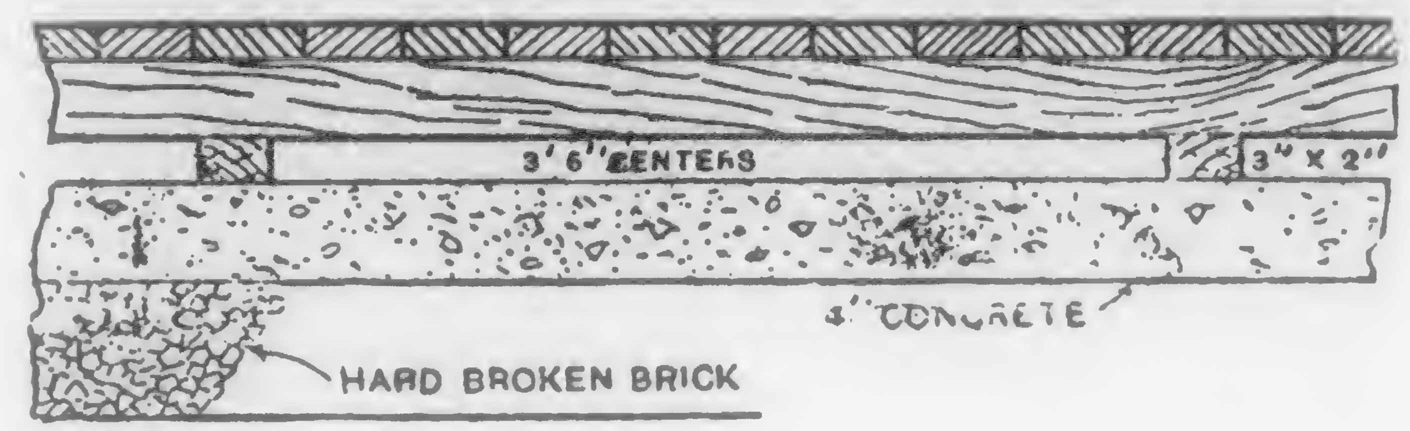


Fig. 2

⅜ inch by 1 inch, and should be painted one coat before being laid. The flooring boards should be secured with cut flooring brads, two to each joist, weighing 20 pounds per 1000. The edges and rebates of the boards should have a thick coat of white lead paint applied when being laid and before being cramped up.

Provide and build in, in concrete, at intervals of about 6 feet, strong cast iron galvanized gratings 9 inches by 3 inches, with a galvanized cast iron sleeve 9 inches by 3 inches, built in behind the air grating through the wall cavity.

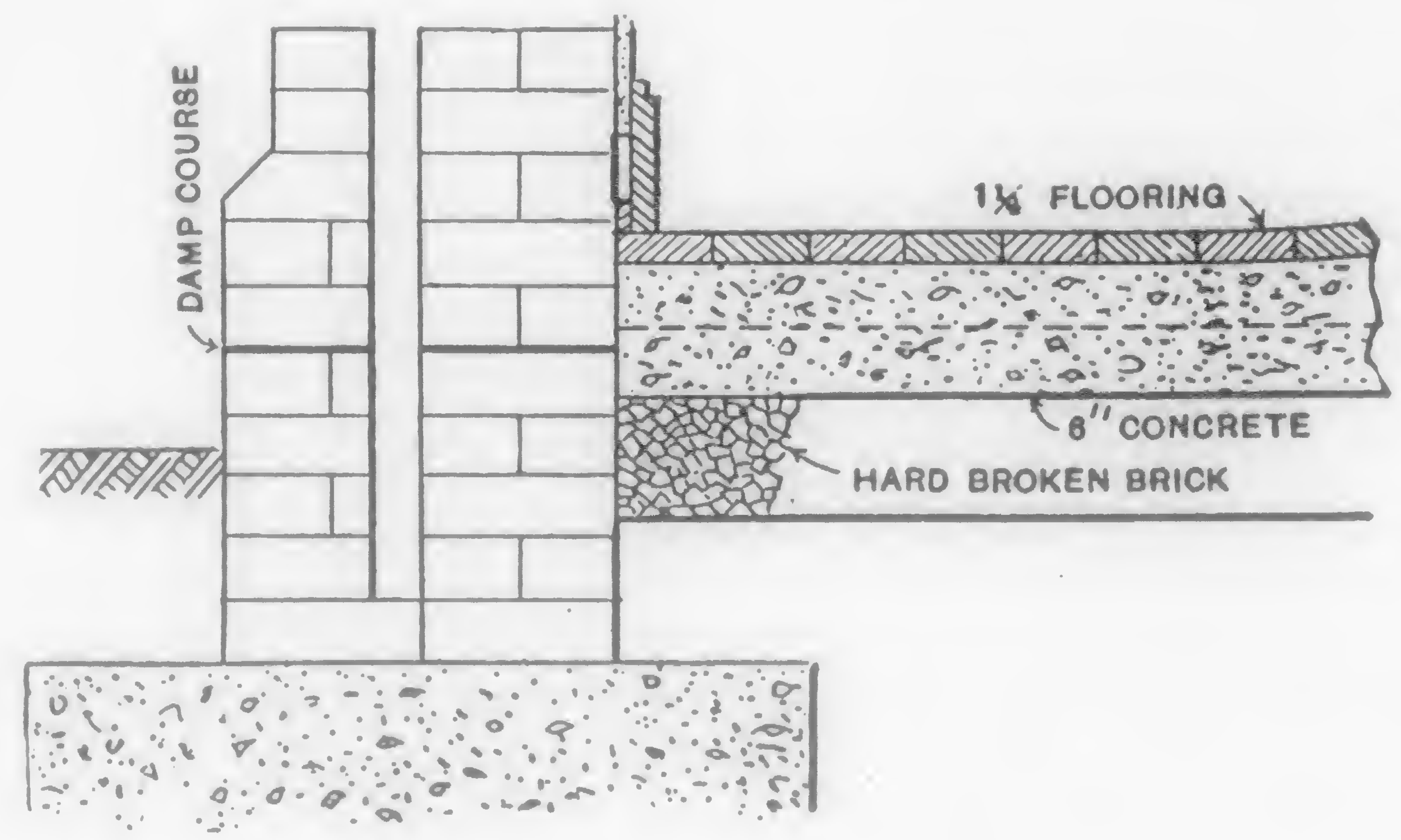


Fig. 3

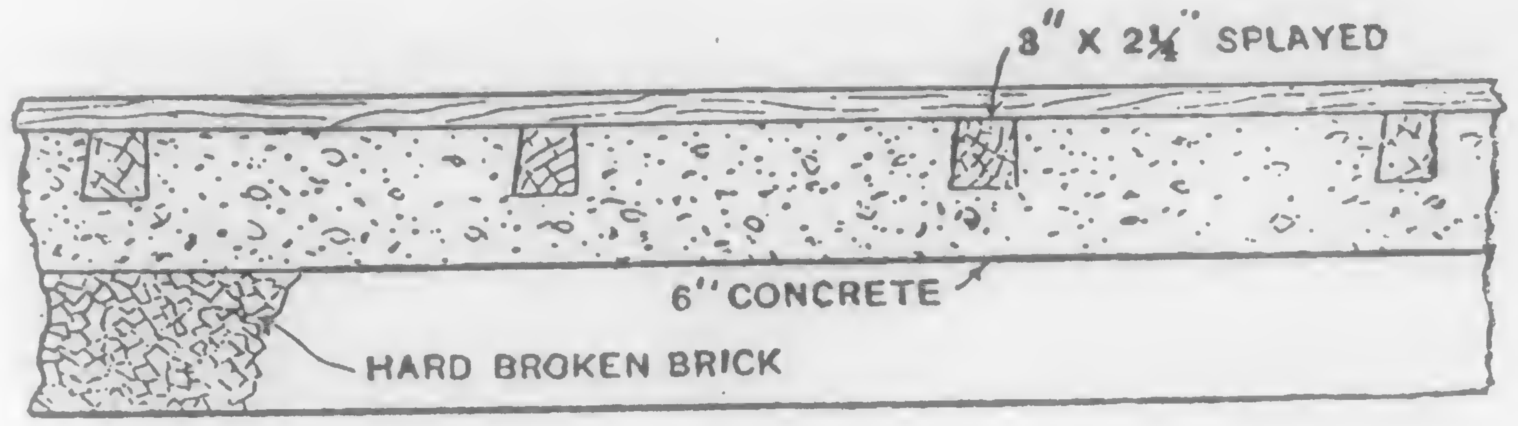


Fig. 4

The floor shown in Fig. 3, of which Fig. 4 is a longitudinal section, is, as regards preparation of ground, provision of hard, dry, brick filling, proportions, etc., of concrete, the same as the floor in Fig. 1, but the concrete is 6 inches thick instead of 4 inches, and the sleeper joists are bedded in the concrete, being first creosoted to protect them from decay.

The sleeper joists should be of fir, free from all defects, and creosoted, 8 pounds to the foot cube, 2¼ inches by 3 inches, extreme scantling, splayed one edge, and securely and evenly bedded in the concrete 1 foot 6 inches center to center.

The "fat" portion of the mix is to be brought to the surface of the concrete, and all floated off level with the faces of the sleeper joists, and upon this floated surface the flooring is laid in a bituminous composition, composed of tar and pitch, in the proportions of 100 pounds of pitch to 7½ gallons tar, boiled together for an hour or more, which will result in an elastic and tough composition when set. The dimensions of the sleeper joists are such as will admit of four being cut out of a 3 inch by 9 inch plank. The flooring is to be in 4½ inch widths, laid with straight joints and splayed heading joints, secured to the sleeper joists with two brads to each joist, weighing 20 pounds per 1000, as in the other floor.

If preferred, instead of creosoted sleeper joists, concrete block 3 inches by 3 inches, and, say, in lengths of 3 feet, may be bedded in the concrete in continuous lines at the same distance apart, the flooring brads being driven into the concrete block.

* * *

San Francisco's Remarkable Building Record

According to figures that the San Francisco Architectural club has prepared the value of new buildings erected and alterations made in San Francisco from May, 1906, to July 31, 1909, is $139,584,538, divided as follows: Eighty-six class A, value $20,063,260; 113 class B, $8,435,871; 1,477 class C, $45,510,641; 13,444 frame, $55,487,512; 7,198 alterations, $10,087,254.

This, of course, does not include the value of the buildings in course of construction when the figures were prepared. These, with the buildings begun since, would bring the amount very much higher.

The amount of steel used between the dates mentioned is 284,715 tons, valued at $20,784,195, or an average of $73 per ton.



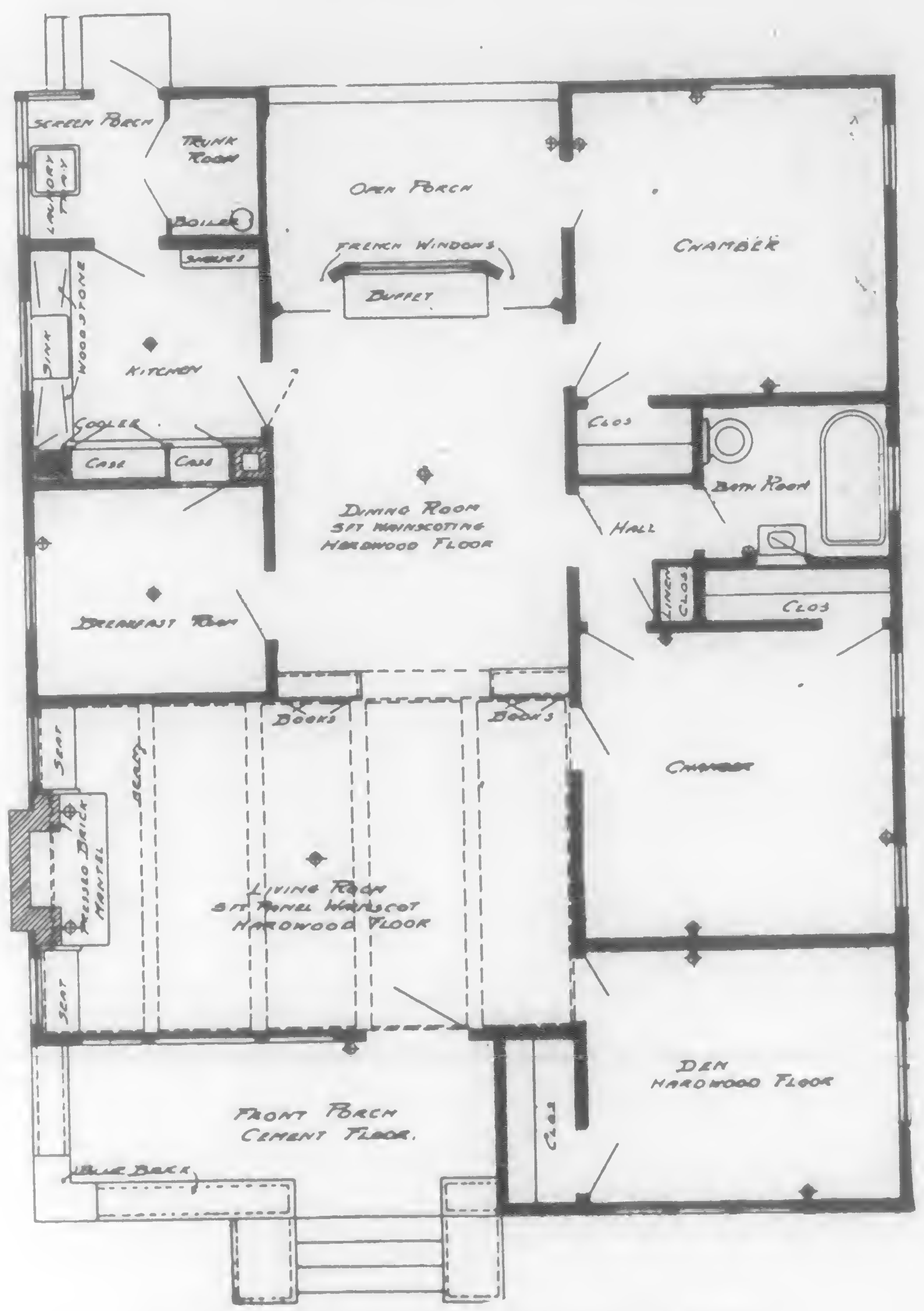
Illumination of Market Street, Looking Towards Ferry, During The Portola Celebration, San Francisco, October 18-23
Central Electric Company, Contractors.

Marvelous Lighting Effects a Feature of the Portola Celebration

One of the many attractions of the Portola Festival held in San Francisco October 18-23 was the electrical illumination. Probably no single feature of the celebration will linger so long in the minds of the spectators as the marvelous lighting effects. On Market street night was as bright as day, the illumination covering six miles of thoroughfare. Not only were the streets canopied with myriads of glittering bulbs but the business buildings and hotels were outlined with incandescent lights that pierced the dark background with a sharpness that could be seen for miles. The most spectacular of all the bewildering electrical effects was the great bell built of a thousand lights and which hung majestically over the city at Third and Market streets. The long strings, gracefully looped, flashed white and green, red and yellow, the whole piece spreading out a luster that reached to the farthest hills. An occasional slight breeze would swing the lights in easy motion, presenting a rare spectacle to those below. The effect was even more brilliant than its makers had expected. According to the electrical contractors the bell alone carried over 1200 sixteen-candle lamps, while the total candle power for each night's illumination aggregated something like 30,000,000.

* * *

Farmer Foddershucks—Haow do them summer boarders of yourn keep busy? Reuben Robbins—They play golf. Farmer Foddershucks—What'n Sam Hill's that? Reuben Robbins—'S near's I kin figger it's solitaire shinny.—Cleveland Leader.



Floor Plan of a Seven Room Bungalow, Los Angeles

A Woman Architect Designed This Ideal Floor Plan

A WOMAN is expected to know just how a house ought to be arranged to secure the greatest convenience and comfort. But there are few women who have any practical ideas about building, and a lesser number who have any practical knowledge of making plans, according to a writer in The Southwest Contractor. When a woman architect, therefore, designs her own home there is naturally keen interest in knowing just how she has worked out the problems that confront every one with limited means in building.

Miss Clara C. Alden, with Edelman & Barnett, architects, Los Angeles, has recently designed for herself a seven-room bungalow to be erected at Santa Barbara street and Halldale avenue.

There are no special features in the exterior construction. It will be the typical bungalow style—resawn redwood siding, shingle roof, blue brick porch and chimney and upper third sash with wood muntins. But the interior arrangement is clever and original. Naturally it is designed to conform to the needs and in a measure the ideas of the family, which consists of Miss Alden, her mother and brother.

The lot upon which the house will be built is 52 by 134 feet and it has a west street frontage. Much is gained by the ample ground space, as the accompanying floor plan will show. The dimensions of the house are 34 feet by 44½ feet. The living room will be 13 by 20½ feet, and the dining room 12 by 14 feet. Both these rooms will have a five-foot paneled wainscot and oak floors.

In the living room there will be a beam ceiling, while the dining room will have a cove ceiling. The fireplace in the former will be faced with old gold pressed brick, and there will be built-in seats on either side. Between the living and dining rooms there will be a cased arch without the customary supporting columns. The bookcases will be built up to the height of the wainscot. The rear of the dining room will be a bay, with a built-in buffet five feet high. Over the buffet will be an art glass window, and on either side French windows.

The rays of the morning sun streaming through the art glass window will give a very pretty effect. The arrangement of the living and dining rooms will also give a very striking and pleasing vista from the front entrance. The trim of these rooms and the den will be slash grained Oregon pine with Flemish oak finish. The den is arranged so that it may also be used for a spare bed room if desired.

No room is wasted in the kitchen, which is built for convenience and with a view to lightening the cares of housework. There will be a woodstone drain board and ample cupboards and bins. It will be noted that the cooling closet is removed from the kitchen flue and boiler and is on the outside of the house where free circulation of fresh air can be obtained. While ample closet room is provided in the chambers, it will be noted that none of the closets are designed as receptacles for trunks. A trunk room is provided on the screen porch. The woodwork in the chambers, which are each 12 by 12 feet, and the bath room will be finished in white enamel. The rear chamber has a door opening upon an open sleeping porch.

The estimated cost of the house is $2500.

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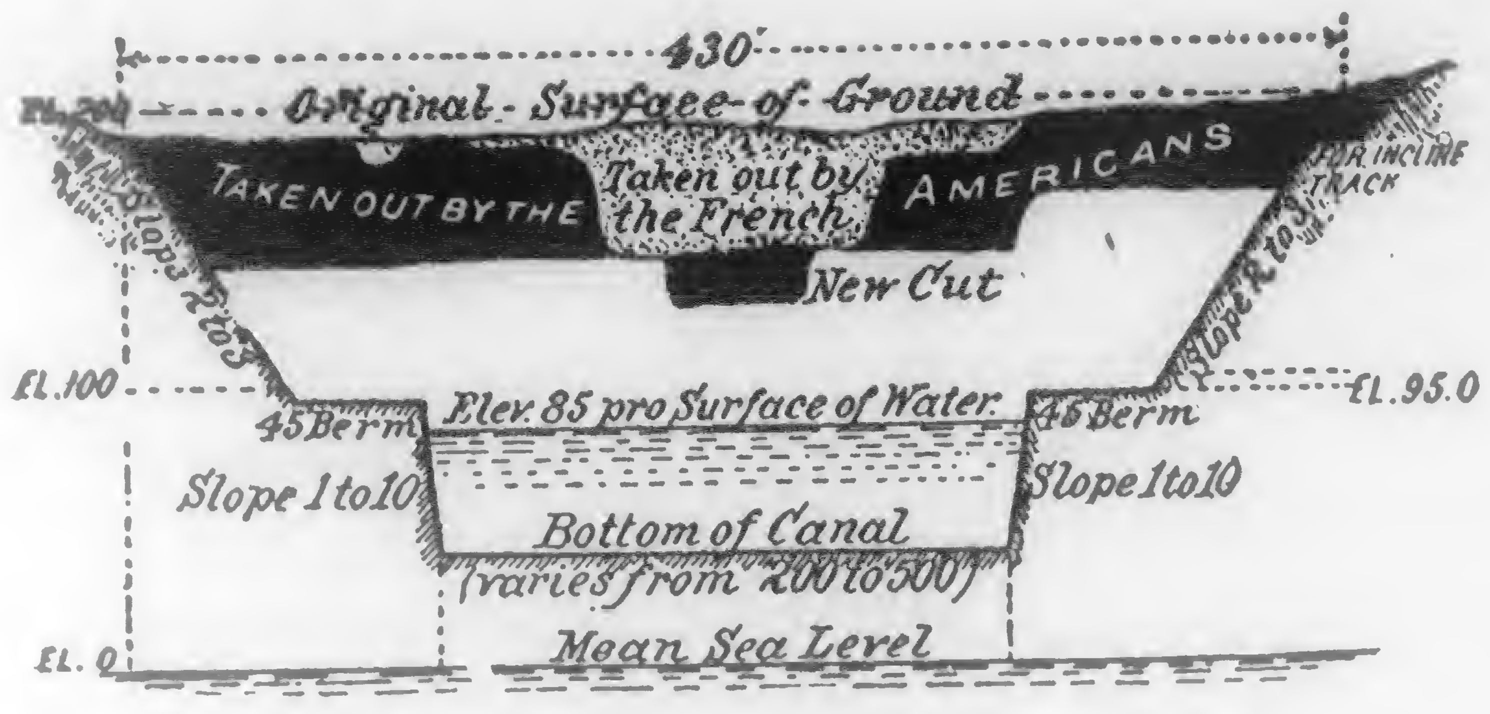
Naming the Twins

The naming of the twins was the subject of an amusing story told by Lady Balfour, of Burleigh.

"A friend of mine," she said, "had the good fortune—or misfortune—to have three sets of twins, and as each pair came the parents puzzled their brains to discover suitable names for them.

"The first pair, being girls, were called Kate and Duplicate; the second, a brace of boys, were named Peter and Repeater, and the third, also boys, Max and Climax.

"But the question then arose: What if there should be a fourth, and even a fifth pair? A young lady solved the difficulty respecting the fourth by suggesting Ann and Another, while in the case of the fifth a well known authoress came to the rescue by suggesting Hugh and Cry."



Section of Culebra Cut

All About the Panama Canal

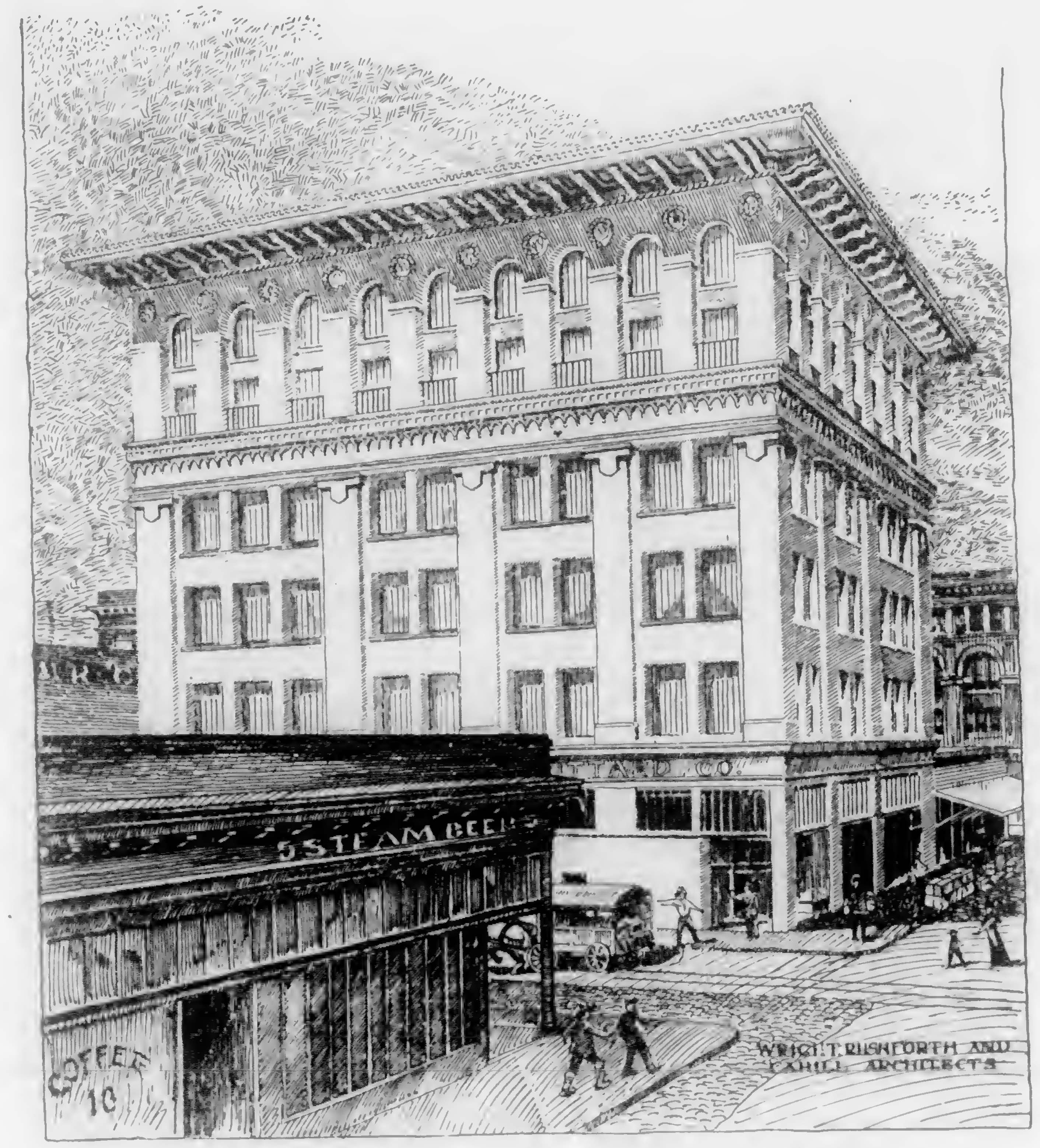
THE following from the Sphere, London, is, with its accompanying cut, a marvel of conciseness and clearness:

Since May 4, 1904, the Americans, having bought for a sum of about £8,000,000 all the rights and property in the derelict French company, have been in possession of the works and have continued operations on a truly gigantic scale in face of the innumerable difficulties which beset all works in a tropical climate. The chief difficulties which the new proprietors have had to encounter may be divided broadly into three sections: (1) The problem of health and hygiene; (2) the obtaining and maintenance of a sufficient force of laborers; (3) the engineering problems connected with the undertaking. The control of the river Chagres, with its sudden and enormous floods, has been one of the main difficulties to be contended with, and large controlling works and diversions will have to be made to enable the dam to be built. Double sets of three locks in flight capable of accommodating vessels of 1,000 feet in length and 100 feet in width will carry the vessels from sea-level up to the great Gatun Lake, which will have an area exceeding 170 square miles. The navigation channel through this lake will have a minimum depth of 45 feet and a width at bottom of from 1,000 feet at Gatun down to 200 feet through the Culebra cutting, the narrowest part of the canal. At Pedro Miguel, a distance of about 10 miles from the Pacific entrance, the summit level will end, and a descent of 30 feet will be made by means of a lock to a channel of some 500 feet in width, extending as far as Miraflores. Here two more locks will lower vessels to the Pacific sea-level. From Miraflores a width of 500 feet is maintained until the Pacific entrance is reached.

* * *

Have to Show Them

Polar explorers, bear in mind
 The people are the jury,
And when you "poll" them you may find
 Too many from Missouri.
—The Chicago Tribune.



Design of a Wholesale House for Judge Dorn, San Francisco
(Note the Portola Spirit in the Spanish Decorations)
Wright, Rushforth & Cahill, Architects

Passive Philosophy

Now when a man to silence clings
 Steadfastly day by day,
There are a lot of foolish things
 A fellow doesn't say.

When he pursues his daily round
 And to the line doth hew,
A lot of foolish things, I've found,
 A fellow doesn't do.

And when a chap has reached a pitch
 To mind his biz, you bet,
There's lots of trouble into which
 A fellow doesn't get.
—Louisville Courier-Journal.



Head Building, San Francisco.
William Curlett & Son, Architects.

The Training of a Young Architect

A WRITER in a recent number of the "Architectural Association Journal," gives the following advice to the young architect:

I need not urge you to study old buildings; the young architect takes to that as naturally as a duck to water. But in your study do not waste too much time in making sketches and views. Rather measure and plot in the field what you measure; by that means you can learn scale, one of the chief, as it is one of the most subtle factors in our success. You will learn the relation between the scale drawing, by which we must express ourselves, and the actual building. Do not be afraid of submerging your own individuality; modern architecture can never slavishly copy. A house suitable for the altered ways of our times cannot have the simplicity of plan and arrangement of an Elizabethan house. It is not worse because more complex. Evolution in thought, as in the life and physical structure, always tends to greater complexity, and the loss in simplicity is the necessary accompaniment of the higher life. Your buildings then are inherently different; but in the things which have to please the eye only, you will find that man's affection goes out to all that his fathers have loved; that the ways of using materials which commended themselves to your forefathers were arrived at by long trial and effort, and based on sound reason, and can only be improved on by patient and slow advance—never per saltem.

Remember that the soldier passes but little of his life in the actual clash of opposing squadrons the love of which perhaps made him a solider. So a large part of your life must be passed in the patient drudgery of your profession, in working out schemes for petty alterations, entailing great labor, but giving little scope for what you rightly call real architecture. But in it all, there is a right and a wrong way to do it, and when you tackle an uninteresting problem in the right spirit, you strengthen your intellectual muscles for some contest more worthy of your powers, and keep yourself in training for the time when you have to battle with some difficulty calling forth them all. For, remember, everything seems arrayed against the architect. The inertia of men and things which is so appalling, must be overcome; you have to go out to do battle with your brick and stone.

* * *

Artistic Bathrooms

A well-to-do man, whose new residence was recently completed, hit upon a novel plan for decorating the bath rooms. In one of them the floors and walls represent the bottom of the ocean. Marine plants and fishes are painted on a dark green back ground. In the other bath room the beach at Atlantic City is represented, and among the crowd of bathers are the man and his family. The work was executed by a well-known artist, and the likenesses are good.

* * *

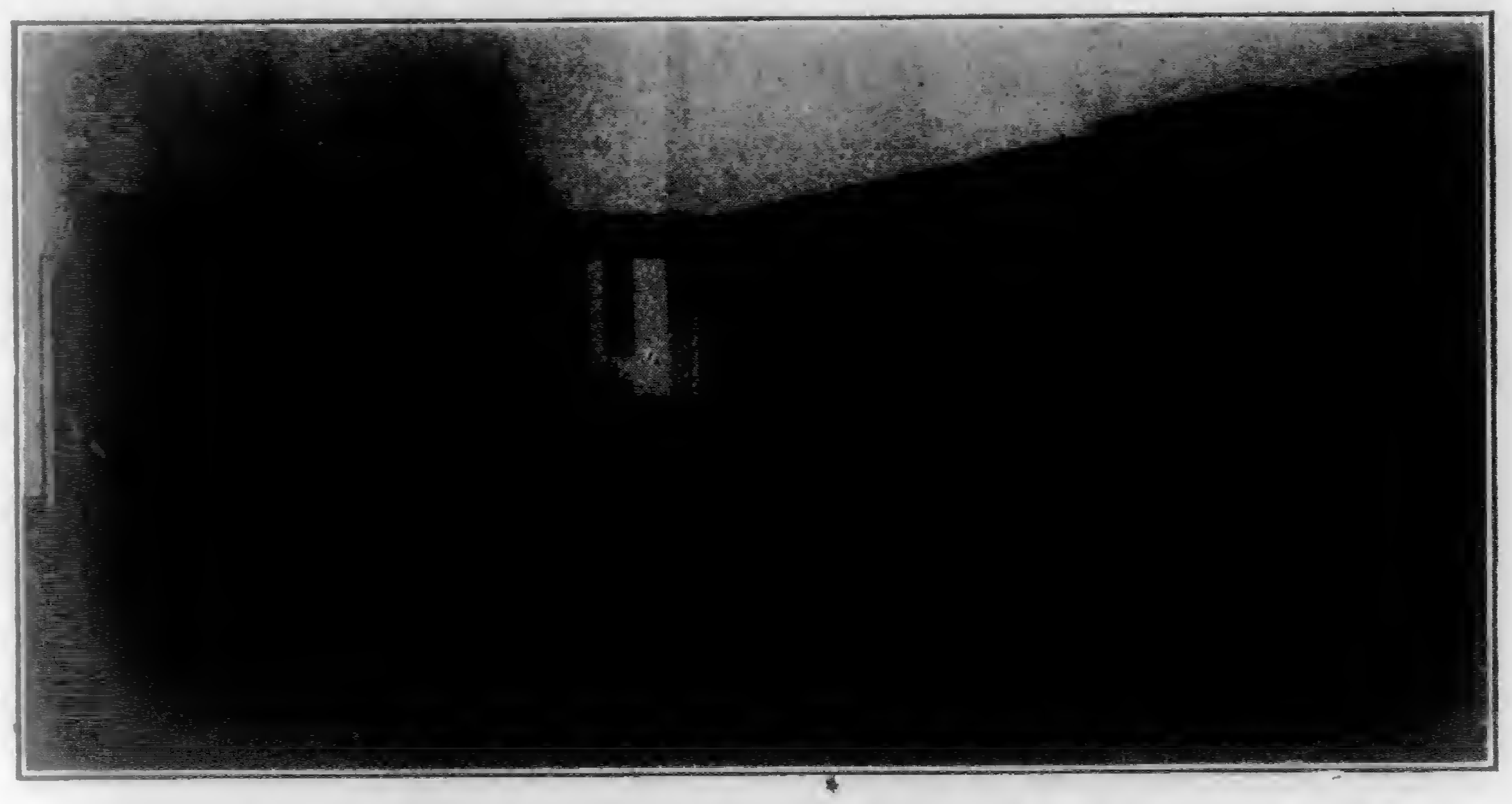
It Sometimes Happens

"You say Opportunity once knocked on his door?"

"That's what she did."

"Where was he at the time?"

"He was out telling another fellow how to succeed."—Birmingham Age-Herald.



Salesroom of the Inlaid Floor Company, San Francisco, Showing Specimens of Some of the Firm's Beautiful Work

Cleaning of Brick Fronts

An expert in the sand-blasting trade who has operated on many buildings, on being asked as to the efficiency of the sand-blast upon soiled brickwork, said that he could not advise it except when the brick were extremely hard. When used against stone the blast does not remove the original face of the brick, he said, "only the grime." That is the aim of the skillful operator. But in the case of brick not extremely hard the result might be different.

You can imagine that the force with which sharp sand can be driven through a fine nozzle is very great. If permitted it would actually cut a stone in two in no time. In the case of granite, marble and cut stone the skillful operator preserves the original face of the block, but he cannot guarantee to do so with respect to all sorts of front brick. I would advise cleaning front brick with acid instead of sand-blasting. The same opinion seems to be held abroad. The cleaning of brick fronts was the interesting subject of a paper recently read before the German Association of Brick and Terra Cotta Manufacturers. The author protested against the use of sand-blast or other method by which the original face of the brick would be taken away, saying:

"When the blast is used, and the face of the brick taken off, cleaned front will show a good appearance only for a short time, as the brick with the original face removed will be very much more porous than before, and absorb dirt more readily. The use of steel brushes is also very bad, and will not give a first-class job.

"The best method is cleaning the brick fronts with a solution of muriatic acid. The strength of the solution can be made to 1 in 12. When this solution is too strong for the brick, acetic acid should be used. A good soap solution will, as a rule, take off all thick dirt, and the cleaning with acid solution can then be done easily."—National Contractor and Builder.

* * *

"Maria, do you remember that fine dinner you got up all by yourself on the day I asked you to be mine?" "Yes, indeed, George!" "Everything was splendid." "I am sure it was." "Ah, I wish your mother was living with us now, Maria!"—Pluck.

Will Terra Cotta Replace Wood?

THE approaching world's timber famine is beginning to worry constructors, and will mean that if afforestation is not taken in hand immediately other materials must be found to take the place of wood. The United States Government has established laboratories at various centers for the purpose of testing all sorts of structural materials. The results of these tests are published from time to time, and in this way architects, engineers and contractors are informed as to the capabilities of the materials.

Only within the last year or two has general interest in the diminishing timber supply been aroused, and to that condition may be traced also the invention of novel building materials.

Thus there is a constant attempt to employ for building the only substance of which the supply is unlimited, the soil of the earth itself. Especially is this so in and near the big cities, where the scarcity of timber and the consequent high prices are felt most seriously. For here the difference in price between a frame house and a house of more solid material is so small as to be unimportant.

Illustrative of the general tendency to find substitutes for wood is the suggestion of Herbert M. Wilson of the United States Geological Survey, that scientific investigations into the properties of clay be undertaken. The American Ceramic Society made a start in this direction by appointing a special committee to report upon a plan "for systematizing the study of clay products."

Individual builders meanwhile have gone ahead and demonstrated the practicability of their ideas. Last year the building departments of New York city, for the first time in its history, received plans for a terra cotta house. The plans were passed upon favorably, and the house, which belongs to a professor in a New York university, has just been completed.

In the suburbs around New York there have been put up recently several terra cotta dwellings. The principal element in them is the hollow-tile block.

* * *

Ugly Interiors Disappearing

THE increase in the demand for artistic interior decorations by the home-owners of America is making its influence felt, and the keener minds in the field are not slow to take advantage of the new conditions. While there are those who will maintain that there is no material change in the order of things, their wiser competitors, alive to every opportunity, make the most in dollars and cents of the new call for really decorative furnishings. The great middle class has awakened to an appreciation of the absurdity of their satisfaction with ugly furniture, wall paper and other features that make up the rooms in which they spend the greater part of their lives. It is good that they should begin to realize the uselessness of giving their homes an unpleasant aspect when it entails scarcely any more expense to have everything agreeable and artistic.

The interior of the average American home has undergone a radical change. The day of the painful wall paper, offensive rugs and hideous chromo is fleeting. Even in remote places, those who have money enough to erect a fine house seek to have the interior in keeping with the outside view. Not so many years ago it was a common thing to come upon a

handsome exterior that housed a collection of impossible monstrosities in the way of decorations that the poorest designer could imagine only in a horrible nightmare.

The origin of the change was in the larger cities. It was natural for those who traveled abroad and came in touch with beautiful European furnishings to desire something artistic in their own homes. And out of the desire grew the demand. As the visits to foreign countries became easier and less expensive to undertake, the influence on American home-owners grew. This influence was felt in the big cities first, but the dwellers in the larger centers of population soon communicated the feeling to their country cousins.

In these days when intercourse between the people of every section is so great, the interchange of ideas keeps even the rural folks quite up to date. Farmers use automobiles to go to market, and at any big convention of agricultural interests hundreds of automobiles are in evidence. There are few people who understand to what an extent automobiles have replaced horses in the farming sections. So, too, in the homes of the wealthy farmers, the mounted canary in a glass case has lost his prestige, and the china dog no longer keeps watch lest the visitors disturb the family crayons. The stuffed crocodile and the iron turtle have been relegated to the lower regions to keep company with the cook. When Denman Thompson first produced "The Old Homestead," all the horseplay in it was amusing. When the old man visited the city his lack of acquaintance with modern furniture made him uncomfortable indeed, but if you saw the famous play recently you know that his uneasiness furnishes little amusement, for he must be out of the world entirely to be so ignorant of the decorations that are supposed to cause him so much wonderment. Even in the rural districts, Denman Thompson's antics, when he first comes in contact with the "city furnishings" would arouse no laughter, for the ruralites are advanced in the knowledge of what's what.

Old ideas in decoration, as in other things, are gone. A new day has come. Easy and cheap transportation made new and better conditions in the smaller cities. Now whatever influences the metropolis in a lasting way soon makes itself felt in every nook and corner of the country. A change in one line makes a change in many, and certain conditions make themselves felt in every line of business. There's a cause for every radical change, and it is seldom difficult to trace the reason of any marked development of taste.

In this instance the commercial enterprise of Americans has been instrumental in bringing about a greater demand for decorative home interiors. Business and art may be separate, but generally there are commercial reasons back of the growth of an artistic idea. The spread of the desire for artistically decorated homes has been rapid and grows each day. In the decorative furnishing business, the leaders know that a new day has dawned.—Interior Decorator.

* * *

Carpenter's Long Fall

While Joseph Beauleu, a carpenter, employed in the erection of a tower for one of the attractions for the exhibition at Sherbrooke, Man., was on the topmost part of the tower, the board upon which he was standing broke and he fell a distance of 91 feet into a tank containing only two feet of water. He was practically uninjured.—Winnipeg Tribune.



House of Dr. A. M. Barker, San Jose
Wolfe & McKenzie, Architects

Southern Pacific May Adopt the Concrete Railroad Tie

A SAN JOSE man has invented a reinforced concrete railroad tie which comes nearer the goal of success than any similar invention yet placed on the market. The Gates tie—Gates is the inventor's name—has been given a most severe test in the freight yards of the Southern Pacific railroad at San Jose, and despite the heavy traffic to which it has been subjected not a single instance has developed where the concrete has shown signs of breaking or other evidence of weakness under the rails. The value of this device to the railroad world is fully appreciated by those who are in the transportation business for they, better than the layman, realize the cost of maintaining a roadbed where the loss by decay, breakage and the ravages of insects aggregates millions annually.

There is one feature about the Gates' reinforced railroad tie that is deserving of more than passing notice and that is the fact that it is so constructed that it possesses a certain amount of elasticity which, according to the best informed railroad men in this country, is absolutely essential where the traffic is heavy. Apart from the fact that the tie itself is practically indestructible it has still another advantage which the wood tie cannot claim and that is the clutch which holds the rail to the tie, preventing derailments and thus reducing to a minimum the primary cause of nearly all railroad accidents.

That the concrete tie will ultimately replace the rail support now in use seems a foregone conclusion, as its commercial value has been fully established by the severe test given it during the past two months in the yards of the Southern Pacific.

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San Francisco Architectural Club

OFFICERS FOR 1909

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OFFICERS FOR 1909

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Washington State Chapter, A. I. A.

OFFICERS FOR 1909

President...........................C. H. Bebb
Secretary...................Arthur J. Russell
Treasurer........................J. F. Everett

Opens Office in Oakland.

Architect Lewis Stone, formerly of Stone & Smith, Mechanics' Bank building, San Francisco, has established offices in the Bacon building, Oakland, where he will continue the practice of architecture and will be pleased to see the many clients of the old partnership. Considerable work that was taken during the partnership of Stone & Smith will be carried on by the old firm until its completion, including the reconstruction of the High school at Fresno.

License to Practice.

At the last meeting of the State Board, Southern Division, the following were granted State certificates: J. J. Backus, chief inspector of buildings, Los Angeles; F. P. Davis, A. L. Acker, H. F. Whitney, E. C. Andrus.

Annual Meeting of San Francisco Chapter, A. I. A.

THE annual meeting of the San Francisco Chapter, American Institute of Architects, was held in the white and gold room of the Hotel St. Francis on Thursday evening, October 21, 1909, with the largest attendance in the history of the chapter. The guests of the evening were: Mr. Cass Gilbert, president of the American Institute of Architects; Mr. Irving K. Pond, second vice-president, and Messrs. D. J. Myers, W. R. B. Wilcox, Carl Gould, A. F. Rosenheim, August G. Headman and M. A. Vinson.

The principal business transacted was the appointment of committees to draft suitable resolutions upon the deaths of Mr. Charles F. McKim and Mr. Robert H. White, a former member of the chapter; the election of Mr. George Taylor Plowman to membership in the chapter, and the election of officers for the ensuing year, which resulted as follows:

Mr. William Mooser, president.

Mr. Louis C. Mullgardt, vice-president.

Mr. Sylvain Schnaittacher, secretary and treasurer.

Messrs. Henry A. Schulze and William Curlett, trustees.

Mr. Cass Gilbert, the distinguished guest of the Chapter, then addressed the meeting, stating his appreciation of the manner in which he had been received and entertained during his visit to San Francisco, and of his admiration for the performance architecturally which he had noted, and for the spirit behind it. He spoke learnedly of the profession of architecture, the duties of the architect and the relation between architect and client, and the underlying principles of the American Institute; of the necessity of architectural organizations with a common purpose of acting in harmony; also the necessity of the architectural organization, and of the individual taking an active interest in all affairs in which architecture is concerned. He spoke of the power of the architect and of architectural societies in civic and political affairs and urged that that power be used in uplifting the profession.

Mr. Gilbert said it was his opinion that it would be but a matter of time when a Council of Fine Arts would be organized at Washington to supervise the design of public monuments, and also only a matter of time when Institute conventions would be held on the Pacific Coast. He spoke on the general contractor and his relation to the architectural profession, and advised the Chapter to guard against this danger. He further advised the Chapter to take an active interest in the conservation of the natural resources of this country, and closed his remarks with a tribute to Mr. John Galen Howard for the work and architecture of the State University.

Mr. Irving K. Pond was next introduced, and spoke of the business side of the architectural profession and told what had been accomplished in Illinois by the Illinois Chapter, the Chicago Architectural Club and the Chicago Architects' Business Association. He spoke of the necessity of providing education to obtain able draughtsmen, and expressed his appreciation for the attention he had received during his stay in San Francisco.

Mr. A. F. Rosenheim, the new president of the Pacific Coast Architectural League, made a few brief remarks and was followed by Messrs. Myers, Willcox, Gould, Headman, William Curlett and J. W. Reid.

The retiring president of the Chapter, Mr. Pissis, was tendered the thanks of the Chapter for the able manner and fidelity with which he presided for the past three terms.

Irving K. Pond Banqueted by Los Angeles Chapter.

Mr. Irving K. Pond, vice-president of the American Institute of Architects, was guest of honor at a banquet given in the Dutch room of Levy's cafe, Los Angeles, by the Southern California Chapter, A. I. A. About twenty-five members of the Chapter were present, President Frank D. Hudson acting as toastmaster. Mr. Pond addressed the gathering in a happy vein, assuring his hearers that the Southern California Chapter was next in his heart to his own Chapter, for to the warm support of the delegates from Southern California he felt he owed his present position of honor in the Institute. He spoke in terms of praise of the types of architecture he had seen on the Pacific Coast.

Other speakers who dwelt upon various topics of interest to the profession were: Mr. Myron Hunt, who spoke of the work and convention of the Architectural League of the Pacific Coast, which was the prime motive of Mr. Pond's visit here: Messrs. Octavius Morgan, John P. Krempel, Fernand Parmentier, A. B. Benton, Theo. A. Eisen, J. Lee Burton, J. J. Backus, who was present as a guest, and others.

Still in Berkeley

Architect George T. Plowman of Berkeley states that he has no intention of removing his office from the college town to Los Angeles. Berkeley is good enough for him. He has, however, opened a branch office in the southern city temporarily while certain work for which he is the architect is under way there.

Engineers and Architects Association.

The first monthly dinner of the winter season was held by the Engineers and Architects' Association of Southern California at the Hollenbeck Cafe, Los Angeles, in October. Sixty-six members and guests were in attendance. In the absence of other officers Mr. George P. Robinson presided. Mr. H. Hawgood, who had been invited by the program committee to give an illustrated talk on San Pedro harbor, was unexpectedly called to San Francisco on business and his duty as chief entertainer was ably filled by Mr. A. H. Koebig, who had hurriedly prepared a paper on the Los Angeles harbor project. A discussion by the members followed, during which Mr. Koebig suggested that reinforced concrete, if it had been thoroughly tested as a durable construction in this class of work, would prove a desirable material for harbor improvements. Mr. E. L. Mayberry asserted in reply that reinforced concrete had been put to severe tests and had thoroughly demonstrated both its practicability and durability.

Pomona City Hall.

Architect H. Alban Reeves, of Los Angeles, has been commissioned by the city trustees of Pomona to prepare plans for the new city hall to be erected on the block of land bounded by Fourth, Fifth, Main and Thomas streets. The building will be two stories in height, 70x90 feet, and built of brick with artificial stone trim. It will contain the council chamber and offices for the various municipal officers. Thirty thousand dollars is available for the construction work.

$200,000 French Chateau.

Architects Francis X. Lourdon and Maurice Herbert of Los Angeles have prepared plans for a chateau of the French Rennaisance type for A. Cherbourgh, to be erected near Chicago. It will be four stories and basement and will contain about 50 rooms. Terra cotta and stone will be used in construction. The estimated cost is about $200,000.

Lansburgh & Joseph Dissolve.

Architects Lansburgh & Joseph, which firm has designed many prominent buildings in San Francisco since the fire, including the Orpheum theater and the Gunst buildings, has dissolved partnership, the dissolution becoming effective on the first of this month. Mr. Lansburgh retains the offices of the old firm on the top floor of the Gunst building at Third and Mission streets, while Mr. Joseph has moved to a suite of offices in the First National Bank building.

Rixford Has His Troubles.

It seems that the San Francisco Board of Public Works is not entirely satisfied with the services of Loring P. Rixford, who succeeded Newton J. Tharp as City Architect. According to the San Francisco Bulletin the hostility towards the city architect has been growing as the result of his apparent neglect of the work of his office. To quote from the Bulletin:

"Four times in the last two weeks he has allowed the Board of Public Works to advertise for bids from specifications issued from the office of the city architect and after the bids were in, made minute changes in the specifications which compelled the board to turn down all of the bids received and advertise again.

"'The changes were so small,' said Mr. Casey, 'that if proper care had been given to the draughting of the specifications in the first place they would not have been needed.'

"Rixford is blamed for putting the board in a wrong light with the public and with the contractors, and was called upon by President Day at the meeting of the Works Board, to make an explanation of the need of changes in the specifications. His reply was:

"'We have expert men in our office to do what we believe is best. That's all there is to it.'

"But that is not all there is to it, as the Board of Works is tired of shouldering blame for laxity in Rixford's office. Rixford has not stood in favor because of his apparent forgetfulness that he was an employee of the board. He was selected to the office by Commissioners Day and McGilvray, Casey declining to vote for him. He was chosen to succeed Newton J. Tharp, as he was a relative and a close friend of the former architect and supposed to be familiar with the work."

Railroad Y. M. C. A. Buildings.

The Atchison, Topeka & Santa Fe railroad has appropriated $150,000 for the purpose of erecting a series of Y. M. C. A. clubhouses at various points along the route for the use of employes. Buildings will be constructed at Dodge City, La Junta, Raton, Las Vegas, Albuquerque, Williams and Los Angeles. The work will be under the supervision of competent architects, and the buildings will range in cost from $10,000 to $25,000.

Phoenix Bridge.

The Board of Supervisors of Maricopa county, Ariz., have accepted the plans of Mayberry & Parker, engineers, of Los Angeles, for a mammoth reinforced concrete bridge over Salt river at Phoenix, Ariz. The plans provide for a structure 2,500 feet long, with approaches of over 600 feet.

San Francisco Polytechnic School.

Plans have been prepared by City Architect Rixford of San Francisco for the new Polytechnic high school which will include a group of buildings situated between Frederick, Willard and Carl streets. There will be three buildings in all. The central structure will be 200 feet long, with a depth of 140 feet and will be four stories high with a basement.

This central structure will be flanked by a two story building on either side which will be 60x60 in dimensions. The shops for technical instruction will be housed in the two story structures.

A gymnasium is included in the building scheme. It will be 56x90 feet in ground dimensions.

The sum of $600,000 was voted by the city for the construction and equipment of the school. The cost of the building is estimated at $500,000, leaving $100,000 for equipment.

Manual Training School for Los Angeles.

Ten acres of land lying between 40th street and North avenue, and fronting 660 feet on the west side of Vermont avenue, Los Angeles, has been purchased by the city board of education as a site for a manual training school, for which Architects Parkinson and Bergstrom are preparing the plans. The new building will accommodate 1,500 pupils and will be two stories high and constructed of reinforced concrete or brick with a cement plaster finish. It will be equipped with a heating and power plant, inclined floor to auditorium, domestic science rooms, gymnasium, chemical and physical laboratories, library, cloak and locker rooms, lavatories, etc. The estimated cost is $245,000.

$600,000 Office Building for Portland.

Architects Reid Bros. of San Francisco have prepared plans for a handsome fifteen-story office building to be erected at Fifth and Alder streets, Portland, for J. B. Yeon, capitalist, and the firm will probably maintain a branch office in the northern city while the building is under construction. Contracts are now being let. The building will be class A and will have an attractive front of terra cotta. There will be stores on the ground floor, a cafe in the basement and offices single and en suite above the second story. There will be four fast running passenger elevators. The estimated cost of the building is $600,000.

New Plan for City Hall.

A probable solution of the San Francisco City Hall problem, with which the supervisors have been struggling for months, has been found in the suggestion of Louis Cowles, an architect, who has submitted plans for a structure which can be placed either on the present site or on a new one as the board may determine, at a cost not to exceed $3,600,000, and possibly less. Moreover, under the Cowles' plan the hall can be built from the current revenues without the necessity of another bond issue. Supervisors Pollok and Payot, who have made a cursory examination of the plan, are so well pleased with it that they intend to have it submitted to the building committee, with a view of making a fuller examination. Cowles' scheme provides for a main structure near the center of the present site, running into a dome, with five buildings radiating from it, and with an arcade connecting the Hall of Records. The main structure will be a rotunda surmounted by a dome. The five wings will be four stories in height, and there will be entrances on City Hall avenue, McAllister and Larkin streets, with other entrances to each of the wings. The building will be of heavy steel construction, with ornamental iron work and glass. There will be no stone used.

Architects Score Burnett Act.

The regular monthly meeting, following the summer vacation period, of the Southern California Chapter of the American Institute of Architects was held Tuesday evening, September 14th.

The chief topic of discussion was concerning the new Burnett Tenement House Act, which has proved a source of annoyance to the architect and owner alike. Among the provisions which found general disfavor were those relating to the construction of light courts, although few of the more radical new provisions escaped their measure of disapproval. It was the general opinion that the act has tended to discourage the construction of apartment houses in Los Angeles. Many inquiries for interpretation of special provisions were made of Chief Inspector of Buildings J. J. Backus, whose views from his official position as head of the Department of Buildings, were particularly sought as bearing upon projects claiming the immediate attention of the architects. It was the opinion of the members that the law is unconstitutional.

The chapter instructed its judiciary committee to bring pressure to bear upon the city officials in favor of immediate action upon the publication of the revised building ordinances.

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CALIFORNIA HAS A DISTINCT TYPE OF ARCHITECTURE.

By CASS GILBERT, President A. I. A.

In California there is developing a distinct type of domestic architecture. The hope has often been expressed that a distinctive American type of architecture would be produced, and I think that there is developing such a type here.

The California bungalow is distinct from the bungalow of India, from which it takes its name, and entirely different from the seaside homes of the East. It is a type of architecture of beauty in its broad lines and depth of shadow.

GOLD MEDAL FOR MOST BEAUTIFUL PUBLIC BUILDING

The Architectural League of the Pacific Coast has started out well. Although still in its infancy its life of usefulness is already being felt. No more popular move could have been made by the League than that taken at the first annual convention in San Francisco the past month, when it was decided to offer a gold medal annually to the coast city which shall have attained the highest merit in the architectural beauty of its public buildings. The gift will unquestionably accomplish the end sought—the encouragement and promotion of the things which make for the "City Beautiful." Every town of any size on the Pacific Coast will be permitted to compete for the medal. The result will be that each municipality will strive to outdo her sister city in building civic structures that will best harmonize with the region in which they are located. A committee will be appointed to determine upon the medal winner and the name of the fortunate city will be announced at the annual convention of the league. We cannot have too much of this spirit of civic patriotism and the league is to be congratulated for taking up the matter at a time when so many municipalities are planning new city and county structures.

ONCE AGAIN: BUILD FIRE-PROOF BUILDINGS

Fireproof construction, for which Mr. F. W. Fitzpatrick of Washington has been an untiring worker, is more a reality to-day than ever before in the history of American building. The architect and the owner are at last beginning to realize the enormous waste that follows in the wake of semi-fireproof construction. The American Architect calls attention to the decreasing use of inflammable materials for office buildings and accepts the fact as a hopeful indication of an undoubted movement for better buildings. But, while signs of reform are evident, there are nevertheless some deplorable abuses of the "absolutely fireproof building" movement. For illustration, we have a number of buildings in San Francisco whose steel frames and concrete walls would make the spread of fire well nigh impossible but for the wood floors and door and window sash in the same buildings. Of what earthly use are fireproof walls and partitions having openings finished with wood jambs and trim and doors of especially well seasoned wood?

The floors, more often than not, contain an inexcusable amount of lumber. They consist of wood sleepers, a rough floor and a finished floor aggregating with the sleepers more than two inches thickness of wood over the entire floor area. Altogether, does it seem remarkable that fires appear to be capable of doing considerable injury to so-called fireproof structures?

Architects' Election.

At the third annual meeting of the Southern California Chapter of the American Institute of Architects, held in Los Angeles in October, Frank D. Hudson was elected president; J. Lee Burton, vice-president; Fernand Parmentier, secretary; August Wackerbarth, treasurer.

Important Competition for Courthouse.

AS STATED in the October Architect and Engineer, Bakersfield, is planning a magnificent courthouse and the board of supervisors has determined upon the rough outline of the sort of building which it believes will be most suitable to the needs and ornamentation of Kern county. The supervisors want competitive plans for a building to cost not more than $350,000. The clerk of the board is Mr. I. L. Miller. The following tentative outline for the design and arrangement of the building has been issued by the supervisors for the guidance of architects who may desire to prepare sketches:

The building is to be three stories in height, with a basement. The basement walls are to be of granite up to the first floor level. Chairman Jastro's preference is for the exterior of the superstructure to be of white sandstone brick. The floor beams are to be of steel and the floors and ceilings tiled, making a fireproof structure.

The building is to have thirty-eight rooms, besides vestibules, halls, vaults, closets, etc., according to the tentative outline in the minds of the supervisors. Mr. Jastro said the members of the board had not sketched the sky line, but he personally was not in favor of many towers and turrets. "Of course there will be a rotunda," he said. There will be an elevator for the benefit of the public and the officials who may have grown too decrepit in the service of the county to climb stairs nimbly.

The arrangement of the rooms by stories will be as follows, unless the present plans are changed:

Top floor—Three court rooms; three judges' chambers; three jury rooms; one grand jury room; bailiff's office, law library.

Second floor—District attorney's office (three rooms), supervisors' room with seating capacity for 200 citizens, three offices for the county clerk, offices of the superintendent of schools, board of education, coroner, public administrator and surveyor.

First floor—Offices of the assessor, auditor, tax collector, treasurer, boiler inspector, health officer, bee inspector, livestock inspector, oil well inspector, horticultural commissioners.

Basement—Janitor, justice of the peace, boiler plant.

Plans must be submitted before December 13.

HEATING AND LIGHTING

The Illumination of a Home Dining Room

By Norman Macbeth in the Illuminating Engineer.

RESIDENCE dining rooms can probably be more easily and effectively illuminated than any other room in the home; but, notwithstanding the simplicity of the problem, the effectiveness of the installation can be, and in very many instances is, very seriously impaired by using fixtures which are entirely unfitted for the purpose. The opinion has been expressed that careful attention to the lighting of the dining room will result in more pleasure to the occupants than may be derived from the illumination of any other room in the house.

The illumination of the dining room shown in Figs. 1 and 2 has been the subject of much favorable comment, and has rarely failed to arouse the enthusiasm of guests, the climax apparently coming with the announcement that the source is an inverted incandescent gas lamp.



Fig. 1.—Night view of the dining room.

Fig. 1, a night photograph, does not convey a proper impression of the illumination of this room. The dome, which is the only light source used, is made of amber, green, rose and ruby colored art glass, and practically all of the light transmitted by these colors to the side walls and ceiling is non-actinic, so that, while these parts of the room are satisfactorily lighted when judged by the eye, these colored rays are of no value on a photographic plate. This may be noted by observing the detail shown in the lower left hand corner of Fig. 1,

where the dark rug is lighted directly from the under part of the dome, and the light wall paper, shown in the rectangular space in the center of this photograph, between the china cabinet and the door, receives transmitted light only; the rug appears to be of a lighter color than the paper. By reference to these same sections in the daylight photograph, Fig. 2, where the tones are given more nearly their correct weight, the above point may be appreciated.

Illumination measurements were taken on a horizontal plane at the table height, for the purpose of determining the intensity effective on the table when it is used as shown in the photographs, or when extended to a greater length. Measurements were also taken on the wall and ceiling to show the increases in illumination at these points, due to light reflected from the table when it was more or less covered with linen.

The proper height at which to place the dome was made the subject of a thorough investigation, as was also the proper reflector to be used within such a dome. In Fig. 3 the position of the eye of a person seated at the table is shown, at the right hand, when sitting upright, and at the left when leaning somewhat forward. It will be seen that a person at one side of the table can plainly see over the top of the heads of those seated opposite and at the same



Fig. 2.—Daylight View.

time neither the mantle nor the reflector can be seen, unless one leans far forward and purposely looks up. Placing the dome higher would bring the full glare of the mantle into the eyes, while lowering it would cut off the view of those on opposite sides of the table.

The relative positions of the lamp and reflector within the dome is such that the vertical angle, from the center of the mantle to the lower edge of the dome, was as small as could be secured, thus permitting the location of the dome at the highest point above the table without violating that more important consideration—keeping the lamp out of the direct line of vision; that is to say, having the lamp and all sources of high intrinsic brilliancy entirely above the lower edge of the dome when viewed from any position around the table.

Summary of Installation.

Dimensions of room, 12′ 10″ x 13′ 10″.
Height of ceiling, 9′ 0″.
Height of table, 2′ 5″.
Height of lower edge of dome, 4′ 6½″.
Height of dome above table, 2′ 1½″.
Height of mantle above table, 2′ 1½″.
Number of mantles used, 1.
Nominal consumption cubic feet of gas per hour, 3.3.
Pressure during test, in inches water, 3.8.

Illumination measurements were made on a horizontal plane 29 inches high (table height) at 1 foot distances, from the side wall to directly beneath the lamp, and at intermediate stations 5 and 13, beyond the latter being where the illumination falls off abruptly, due to the edge of the dome cutting off all direct rays.

The values given below for stations 1 to 9 are the averages of the two sets of readings taken at right angles, indicated in Fig. 4.

The mantle was the original one fitted to this lamp, and had been in use regularly for over six months; no adjustments were made of the lamp, nor were changes in pressude during any of the tests. These were as follows:

No. 1, alabaster cylinder only.
No. 2, half-frosted cylinder only.
No. 3, prismatic distributing reflector with half-frosted cylinder.
No. 4, opal distributing reflector with half-frosted cylinder, the results of which are given in table No. 1.

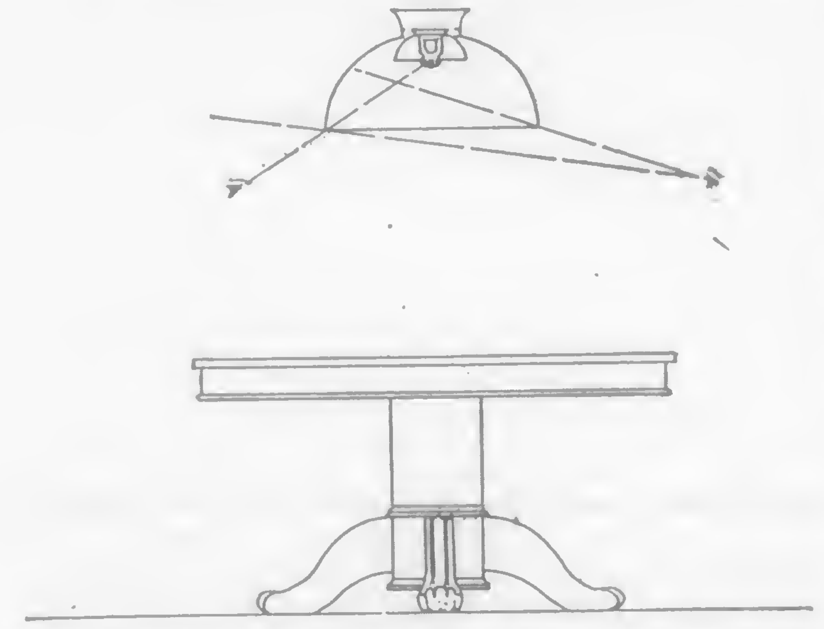


Fig. 3.—Position of the eye of a person seated at the table

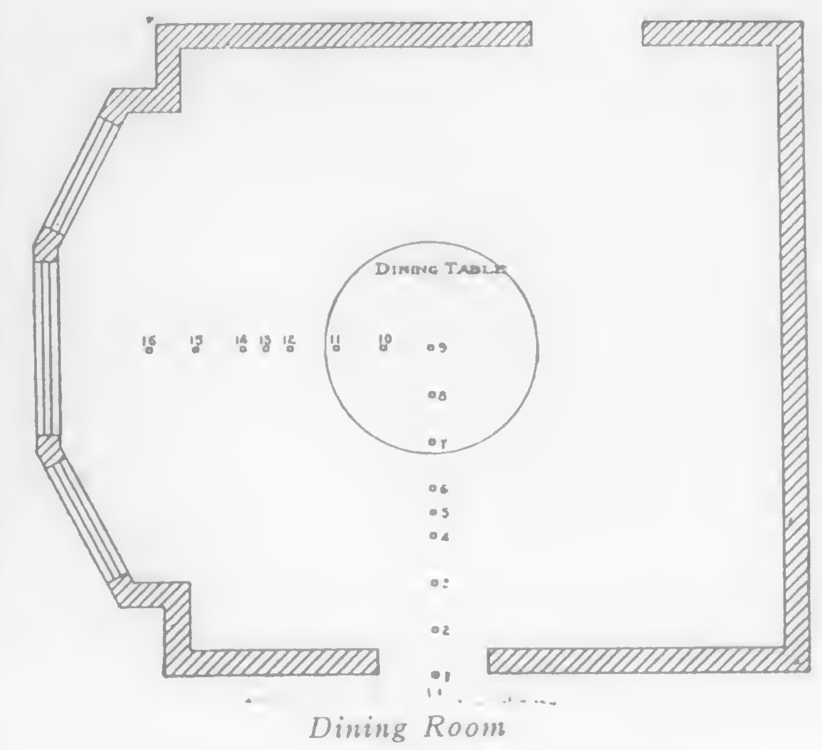


Fig. 4.—Plan of Stations.

The distribution with the prismatic reflector is shown to be somewhat more uniform than that with the opal reflector.

The appearance of the dome was somewhat better with the opal reflector than with the prismatic; the main objection, however, was due to greater depth of the latter when used with this dome, which would bring the lower edge of the prism glass in the line of vision.

Using the dome without a reflector resulted in an unequal and excessive illumination of the art glass, detracting very considerably from its appearance.

In table No. 2 are given the stations, angles, intensity in foot-candles and the apparent candle power, the latter calculated from the horizontal illumination.

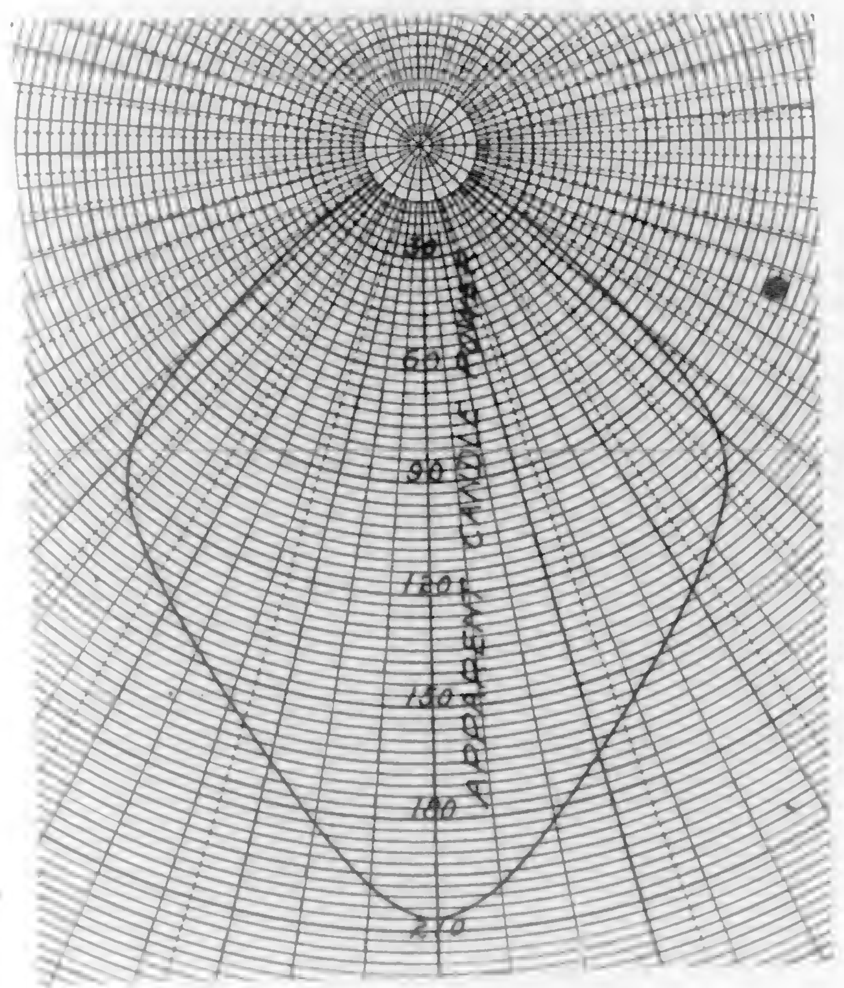


Fig. 5.—Polar Distribution Curve.

Fig. 5 is the polar distribution curve of the inverted incandescent gas lamp with half-frosted cylinder, opal reflector and art glass dome, and is somewhat interesting, as the distance from the center of the mantle to the photometer screen was but 2.91 feet.

The illumination, as measured on the walls and ceiling, with mahogany table, without covering, shows an average intensity of approximately .2 foot-candles. With the table partially covered with doilies the illumination was increased 210 per cent, and with a table cloth the increase was 520 per cent, resulting in approximately 1.25 foot-candles effective on the walls and ceiling, both of which, from a decorator's standpoint, would be classed as light, the walls being a very light gray and the ceiling a light tint, nearly white.

Tell Them Where You Saw It.

Don't forget to say you saw it in "The Architect and Engineer" when you write our advertisers. They like to know that you read this magazine and it makes us feel good, too.

Table No. 1.

Test No.	1	2	3	4
Station No.	Alabaster cylinder only. Foot-candles.	Half-frosted cylinder only. Foot-candles.	Distribut'g prismatic reflector with half-frosted cylinder. Foot-candles.	Distributing opal reflector with half-frosted cylinder. Foot-candles.
1........	.09	...	...	...
2........	.13	...	.14	.18
3........	.16	.16	.22	.21
4........	.39	.35	1.16	.61
5........	1.03	1.53	2.95	2.33
6........	2.33	2.8	4.53	4.30
7........	4.15	5.5	9.2	8.50
8........	5.95	9.05	15.78	15.80
9........	7.60	12.5	17.95	24.28

Table No. 2.

Station.	Angle. Deg.	Angle. Min.	Foot-candles in	Apparent candle-power
9.........	0		24.28	207
8-10......	19		15.8	159
7-11......	34	20	8.85	133
6-12......	45	40	4.3	107
5-13......	50	0	2.33	74.6
4-14......	53	40	.61	24.8
3.........	59	30	.21	13.4
2.........	64	0	.13	18.4

Hanging Lamps.

In many a hall-way is hanging an old-time lantern that performed the same service in a hall two hundred years ago, though, to be sure, they do not now contain the oil lamp, the tallow dip, or a wax candle. On the contrary, they may be fitted out with electricity, and shine forth all the more bravely with a borrowed light, though they certainly do not look out of place in the midst of the old-fashioned furniture that plays its part in so many homes at the present day. Yet the taste for this old type of metal work is apt to be overdone. I have seen a lamp hanging in a house, clumsily made of wrought iron, which looked as though it had been made by a prehistoric blacksmith. To my friend's artistic soul this crudity, this simplicity of design, this clumsiness of manufacture, no doubt appealed. But the lamp, though placed in the hall of a most magnificent building, was more fitted to be hung behind a barn door.

Quaintness in hall lamps is worth while if they combine utility with beauty, and there are many beautiful specimens to be had, with this desirable combination.

Ugliness is always ugly, and the fact of it being two hundred years old should not be any better recommendation for its preservation.—Ex.



Electrolier at San Diego

Street Lighting in San Diego, California.

By C. E. Groesbeck.

THE move for better street lighting, which has spread over the entire country during the past two years, came in from the West, like the weather. The Pacific Coast was the leader in the movement, one city after another taking it up in quick succession and with remarkable enthusiasm.

San Diego must be counted among these enterprising cities. The character of the installation may be fairly judged from the illustration shown. The lamp standard is particularly handsome and elaborate. Six of these standards are placed in each block 200 feet in length, and eight on the 300 foot block. Ninety-six are now in service, and 200 more are being installed. The lamps are lighted from dusk until midnight each night, the property owners along the thoroughfare paying the cost of lighting. Each standard carries six 16-candle power carbon filament lamps and one 32-candle power lamp in the large central globe. Twelve watt series tungsten lamps run in multiple from a transformer attached to the base of the post are being tested. The illumination, as well as the installation, is very satisfactory—so much so that the property owners and merchants along all of the busy streets are taking means to have similar installations made at the earliest possible date.

While the design of the lamp standards is open to criticism from the purely utilitarian standpoint, owing to the obstruction offered to the upright lamps by the rather massive arms supporting them, the distinctly decorative effect of the installation fully compensates for this slight loss in illumination, at least in the opinion of the merchants from whose private purses it is installed and maintained. The merchant realizes that the looks of his store are not to be neglected, and if this is true of his store it is equally true of the street on which his store is located.

The fact that this installation is being put in from private funds calls to mind the numerous other cases in which similar action has been or is being taken. This fact is of wider importance than may first appear. The lighting of business streets in an adequate manner is justly chargeable to those owning property or doing business on such streets, why may not other matters of an equally public nature such as pavements, be just as properly charged to the same sources? Unquestionably a modern street lighting equipment adds to the business of the merchants on the street, but as surely as it adds to trade, it adds to the value of the property, and therefore to the revenues of the city received through taxation.

Furthermore, to increase the value and attractiveness of the business section of a city is to add to the value of the city as a whole. Thus every citizen becomes a participant in the advantages accruing from private enterprise.

Public spirit and private enterprise are by no means antagonistic, and in this particular instance have worked together for good, and the ultimate good that is bound to result from better street lighting is far beyond the mere temporary advantage of the few merchants and others whose foresight has outrun public enterprise.—The Illuminating Engineer.

By the Way

Some Industrial Information Worth the While

A Postal Card Will Bring You This Book.

"Nonpareil Corkboard Insulation" is the name of a handsome new catalogue just published by the Armstrong Cork Company of Pittsburg, Pa. The book contains 120 pages, illustrated with more than 70 reproductions of photographs and drawings. From one standpoint it is unique, being the first book of this size ever published in which the illustrations from photographs are reproduced on antique stock by means of the so-called offset process.

It is unquestionably the most exhaustive treatise on the subject of cork insulation yet published, and as such it will prove of interest to engineers, architects, and all who are concerned with refrigeration in any form. The book contains much information never published heretofore, accumulated through years of practical experience. The results of an extensive series of tests to determine the heat transmission of corkboard of various forms, mineral wool block, wood pulp boards, brick, concrete, etc., the results of fire tests, tests of structural strength, tests to determine the efficiency of the bond between corkboard and concrete are given in detail for the first time. Specifications for erecting Nonpareil Corkboard, with drawings covering every standard type of construction, are an important feature and one which should appeal to every architect and engineer who is called upon to handle this kind of work. Service details—the proper thickness of insulation to install, methods of manufacture, factory facilities, shipping weights, freight rates, etc., combine to make the catalogue a reference book of material value. It will be sent to interested persons free of charge.

New Books.

The Cement Record Publishing Company has recently published an interesting book entitled "Brief History of Cements," by I. C. Johnson of Bravesend, England. This is the first time that the true facts regarding the invention of Portland cement have appeared in print. The price of this book is fifty cents per copy postpaid.

Well Known Contractors.

Of the prominent contracting firms in San Francisco, none is better known than Taylor & Johnson, both partners having been identified at one time or another with much important work in San Francisco and the bay cities. Mr. Johnson was formerly superintendent of construction for Maxwell G. Bugbee, well-known San Francisco architect. The Starr-King church at Geary and Franklin streets, the first religious edifice built in San Francisco after the big fire, was erected by Mr. Johnson, while some of the more important work undertaken by the firm of Taylor & Johnson may be mentioned the Security Investment Company's building and the Nelson-Morris Packing house. The firm occupies offices in the Postal Telegraph building.

Butte Company Manufactures Traveling Hoist.

The Butte Engineering Company has recently taken a contract to build and erect a mammoth electric traveling hoist for the municipal pipeyard of San Francisco. The hoist will handle 32 carloads of pipe daily, having an operating capacity of 350 feet per minute. The big hoist was designed by engineers of the Butte company, and is being turned out at the Butte factory on Howard street. The contract calls for the completion of the hoist in 45 working days at a cost to the city of $2,300.

A New Picture Fastener.

The Star Expansion Bolt Company of 147-149 Cedar street, New York City, makers of the famous Star Expansion bolts, are coming into the limelight again, with a new labor and safety device for hanging pictures and so forth, securely, neatly and in an improved manner.

This product is known as the Sebco Ready Fastener, and consists of a wedge sharpened at one end, having a hole sunk, and threaded at the other. This wedge is driven in flush with the wall, the fixture placed, and a blunt end screw is inserted into the threaded end of the wedge and fastened tight. Whenever it becomes desirable to remove the fastening, the screw is simply taken out, and the wedge being flush with the wall, is not noticed. This product is being sold largely by the better class of picture-frame stores, and by all discriminating hardware dealers.

Rapid Dredging.

The easiest money I ever earned was when I agreed to dredge the ferry slip of the ——— Transportation Company. They were in a bad plight, telegraphing everywhere for a dredger that could be towed up in a hurry; for the river had silted up their landing slip in their busiest season and it meant a thousand dollars a day to them. In the midst of their excitement, I happened into their office and offered to dredge the slip for $500. "Done," said they, and we signed papers on the spot. Then I went out and hired a big tug for five dollars an hour, backed her into the slip, tied her close and fast, and started the engine. In about a minute that big propeller set up such a current that the silt began floating out of the slip in tons. In two hours I called at their office again, left a good cigar, and got my $500.—Benjamin Baker in Scribner's Magazine.

A Wonderful Clock.

The great clock in the tower of the Metropolitan Life Building in New York City was built and installed with all its accessories, by the Self Winding Clock Company, of which Ferdinand Fish of 250 Montgomery street, San Francisco, is the Pacific Coast representative. The big clock with its four great dials, 346 feet above the sidewalk, is visible far and wide over the city. All the space on the dials not occupied by the bronze work and figures is covered with two-inch squares of a material which resists the weather and gives a minimum of expansion and contraction. The field is white; the center design is of smaller cut pieces, and this, with the larger squares of the border, are a rich turquoise blue. The material is new in this country, but Mart & Lawton, contractors for the dials, say it has been used in a similar way for the Duke of Westminster in England.

The dials are 26 feet 6 inches in diameter, the figures 4 feet high, while the hands built on iron frames and sheathed with copper, will weigh 1,000 pounds for the large hand and 700 pounds for the small. The large hand will measure 17 feet from end to end and 12 feet from center to point, the smaller 13 feet 4 inches over all and 8 feet 4 inches from center to point. They will revolve on roller bearings and, like the numerals on the faces, are illuminated by rows of single filament incandescent lamps behind heavy plate glass.

The clock, with its equipment of bells and light signals, an intricate mechanism, is electrically operated and automatically controlled.

The master clock, which is located in the directors' room on the first floor of the old building, is the heart and soul of the entire tower clock outfit; besides this, it controls about 100 other clocks throughout the entire structure, and also controls several program instruments for sounding various schedules of bells in the different departments. This clock is a high-grade regulator, and is adjusted to run within five seconds per month.

All the controlling devices for the tower clock are set to automatically operate from the master clock. At a predetermined hour in the evening the dials are illuminated; also the lantern and its flashing mechanism is set in operation.

How to Keep Floors From Squeaking.

The noise in floors that squeak in various places when stepped upon is caused by the boards rubbing together. A good remedy, says Popular Mechanics, is to turn in screws through the cracks, as shown in the sketch. This can be done at housecleaning time. The screws will either spread the boards or hold them together so they will not squeak.

Furnace Heat for the Home.

Furnace heat is used in thousands of homes and its efficiency depends very materially upon the location of the furnace and the proper arrangement of its connections. The heating qualities of a furnace can be determined by the purchaser by the radiating surface above the fire pot. A small fire box with a large radiating surface will give more heat than a large fire box with a small radiating surface and, in addition, will allow of economy in the use of fuel.

Having secured the furnace the most important problem is the selection of its location. It should be placed as near the center of the building as possible so that its distribution of heat will be equitable in all directions. Care should be taken that every piece fits smoothly and that all the joints are packed with asbestos cement. The smoke pipe should be of steel or galvanized iron, and should be the full size of the furnace cellar. The opening in the chimney should have a heavy iron thimble into which the smoke pipe should fit firmly.

The first and second pipe joints, after leaving the furnace, are the joints on which the check damper should be placed. This should have a chain attached, running to the floor above, so that the furnace may be regulated without the necessity of descending to the basement. A similar chain attachment should be made with the front draft of the furnace. Round, three-piece elbows should be used on the hot air pipes. Registers should have frames which will leave an air space between the register box and the woodwork, and if piping touches the woodwork at any point it should have at least three thicknesses of asbestos paper wound around it, and over this should be a strip of tightly fitted tin. The registers, of course, should be as close to the furnace as possible. If these precautions are taken the furnace will do its best service in the heating of the home.

George R. Greenleaf Moves.

George R. Greenleaf, the Berkeley gas and electric fixture man, has moved to larger and more centrally located quarters at 2134 University avenue. In his announcement to customers, Mr. Greenleaf says: "With this change I will be in a much better position to attend to your patronage in a more practical and able manner."





The New Mission Grammar School, San Francisco
L. P. Rixford, City Architect — *Kittle Construction Company, Contractors*

The New Mission Grammar School, San Francisco.

THE new Mission Grammar School, on Mission street, below Sixteenth, San Francisco, has been completed, and is a credit to the City Architect's office, as well as to the contractors, embodying, as it does, every desirable feature in design, construction and materials. It is a two-story and basement class A building, with granite base, the upper part being of buff-colored pressed brick, trimmed with terra cotta. The bricks are laid in what is known as the Flemish Bond, and it is no exaggeration to say, that no better looking job of brick work has ever been done in San Francisco.

The building has reinforced concrete floors and roof with a copper covered mansard. There is no unprotected wood in the building, all the window frames, doors and trim being of metal or kalamein work.

Every modern improvement for large school buildings has been provided. Strict attention has been paid to proper ventilation and good light and the school house will undoubtedly rank among the best in the country.

The Kittle Construction Company were the general contractors. The brick work was sub-let to T. F. O'Rourk, mason and builder, who completed his contract in forty working days.

A Snap Buy for Draughtsmen.

Draughtsmen who are looking for a bargain in drawing materials will do well to call on or write the firm of Eugene Dietzgen Co., 18 First street, San Francisco, and order a mechanical drawing set from a limited stock which they have on hand and which were not listed in the new catalog. The regular price for a seven-piece set in pocket book case is $13.50. To close out the stock they are being sold for $6.75. Other sets, in less expensive cases, are sold as low as $5.75. The instruments are high class in every particular and would make a splendid Christmas gift. There are only a few of these sets left.

Busy Year for Engineer Breite.

Engineer W. W. Breite, with offices in the Clunie building, San Francisco, has been called into consultation in designing the steel work for no less than fifty-five buildings since the first of last March. It has been a record breaking year for Mr. Breite which speaks well for his high standing with the members of the architectural profession. The steel plans for some of the largest and best constructed buildings in San Francisco were designed by Mr. Breite. At present he is engaged in converting the Jefferson Square building into a club house for the Western Auto club. A feature of the reconstructed building will be an immense reinforced concrete swimming tank, 35 by 95 feet.

The Star Expansion Bolt Company, makers of the famous Star Expansion Bolts, have moved their New Orleans (La.) sales oce to No. 504 Audubon building, where strangers and friends alike will be welcomed by D. S. Miller.

Enos Company Moves Downtown.

In the building of a new home so many problems confront one that it is a relief to be able to determine one's lighting fixture requirements under such favorable circumstances as is possible at the new downtown studios of The Enos Co.

Instead of being led through a maze of glitter and glass by a more or less incompetent salesman, you are taken into a small room where nothing is on display except the fixtures being suggested for your home. This selection is only made after careful consideration of the requirements of your residence, not only from the architectural and decorative treatment of the surroundings, but with a view of reflecting as far as is possible the personality of the occupant.

The result thus obtained means a degree of marmony between the lighting fixtures and the rest of the decorations, which produces that feeling of rest and peacefulness which is the ideal condition in the trulv artistic interior.

Peter August Westberg.

Peter August Westberg, for seven years practicing architect in Los Angeles, died at his Alhambra home October 23d. Mr. Westberg designed and supervised the construction of a number of buildings in Los Angeles and vicinity, including hotels, apartment houses, business blocks and residences. He was fifty-two years of age at the time of his death. He leaves a widow and a son.

A New Invention.

Mr. Charles Hart, the manager of the Hart Heating Company of Oakland, has invented a gas burner which promises to revolutionize the gas heater business.

The ew burner, patents for which have been issued in five countries, is arranged with two crossed wires in the bottom of the burner, which divide the flow of gas into four distinct currents, and thoroughly mixes the gas with air when it has reached the outlet of the burner, which is in four prongs, the whole burner being but twelve inches in length.

The inventor has demonstrated by actual tests, that fully eighty per cent of gas is saved to the consumer.

A wooden splinter, held over the outlet, in the blaze, WILL NOT CATCH ON FIRE; raised six inches above the outlet, it will light at once.

The Hart Patent Burner is smokeless and sootless; is simple in construction and in operation. It will be sold only with the Hart Combination Hot Water Boiler, and the Queen Gas Water Heater.

The Fire Warden of Oakland says of the new burner:

"It is perfectly safe—the best thing in the line that I have ever seen."

A California Made Reversible Window.

Architects are specifying the reversible window more and more as its numerous advantages become apparent. The Dean and the Hipolito windows are manufactured under one and the same patent, the former being turned out in San Francisco and the latter in Los Angeles. The makers have this to say: "This is the modern window. It meets every modern demand for convenience, economy, and the safe-guarding of health and life." As the word "reversible" suggests, the window revolves on a pivot. Both sash may be swung to a horizontal position, or to any angle, or the outside of the sash may be turned inside. The window also slides up and down like the ordinary kind.

"The Hipolito and Dean Reversible Window is a life-saver. It completely eliminates the necessity of the window-cleaner hazarding his life on the outside window ledge. With this window, the cleaner simply revolves the sash, and cleans both sides of the glass from within the building.

"This naturally saves a great deal of time, and consequently increases the window-cleaner's capacity, and decreases the cost of cleaning. It is the experience of building-owners who have installed the reversible windows that a cleaner can handle double the number as of the old sliding variety. This is no inconsiderable matter, for the windows will actually pay for themselves in a few years.

"The reversible window is a health-saver. As the sash can be poised at any angle, the ventilation can be regulated and the draught, usually experienced in opening the ordinary window, can be avoided. Both sash can also be placed at right angles to the frame, and the entire opening used for the free circulation of air. These features are of no small importance when health and comfort are considered."

Burgess Has Money to Loan.

R. N. Burgess & Company has established a San Francisco office in the First National Bank building, at the same time retaining the Oakland office. This firm has considerable money available for building loans and architects who have prospective clients who need money to build with will find it to their advantage to consult with Mr. Burgess. Mention the Architect and Engineer when you talk business with him. R. N. Burgess & Co. will take charge of the construction of the big apartment hotel which is to be erected on Knob Hill from plans by Architects MacDonald and Applegarth.





Interior of Brode Iron Works, San Francisco

Pioneer San Francisco Iron Works.

The many patrons and friends of R. J. Brode of the Brode & Clark Iron Works, 621-625 Howard street, San Francisco, will be interested in the announcement that he is now sole proprietor of the iron works, having purchased all other interests in the corporation. The concern will hereafter be known as the Brode Iron Works, the corporation having been dissolved.

Mr. Brode is one of San Francisco's pioneer manufacturers of structural steel and ornamental iron work, having spent twenty-three years in the business. His first venture was at Eighth and Clay streets, Oakland, Cal., where he operated a plant for a period of eight years. Upon moving to San Francisco a plant was established at Howard and Beale streets, and a good business was carried on there until about ten years ago, when the present location on Howard street was leased. At the time of the fire the works was practically destroyed but rebuilt and three months later operation was resumed. The main shop has a floor space of 45x164 feet. Employment is given to as many as sixty men. Contracts running as high as 500 tons are filled and care is taken that the work is turned out satisfactory to the

architect and his client, both in respect to speed and equality of workmanship. In addition to the large floor space, Mr. Brode is fortunate in having a lease on property adjoining the works, which gives him yard space 45x112 feet, and an excellent outlet for transportation purposes on both Tehama and Hawthorne streets.

The Brode & Clark Iron Works were incorporated about fifteen years ago, but very soon after the incorporation the half-interest of W. A. Clark was taken over by Mr. Brode and George G. Bauer. The corporation continued until a few weeks ago, when Mr. Bauer sold his interest. Mr. Brode is a native of Germany, and in the twenty-eight years he has lived in this country he has worked his way up from a mechanic to the ownership of a splendid and most successful enterprise.

The following is a list of some of the more important contracts filled by the Brode & Clark Iron Works in the past few years:

Grand Hotel, corner Turk and Taylor streets, C. A. Meussdorffer architect; Monroe Greenwood Estate Company building, corner Mission street and Shaw alley, Henry A. Schulze architect; Standard Biscuit Company building, Pacific and Sansome streets, S. Schnaittacher architect; building on the south side of Mission street between Third and Fourth streets, Ross & Burgren architects; Englander building, northeast corner Turk and Taylor streets, Ross & Burgren architects; Andrew Downey building, northeast corner Howard and Second streets, Ross & Burgren architects; Russ building, Montgomery, Bush and Pine streets; Donohue building, southwest corner Battery and Pine streets, Ross & Burgren architects; building Broadway and Front streets, Wright, Rushforth & Cahill architects; Sacred Heart Church, Fell and Fillmore streets, Thomas J. Welsh architect; Home Telephone Company's building, Seventeenth street and Albion avenue, Coxhead & Coxhead architects; Barker, Knickerbocker & Bostwick building, northwest corner of Howard and Second streets, Woodworth Wethered architect; torpedo storehouse, United States Government, Fort Winfield Scott, Presidio, and for a great many other buildings, including the Mission High School, Havens & Hoepke architects, which was erected before the fire and was uninjured by the conflagration.

Personal.

Architect William A. Newman has established himself in comfortable offices in the Hewes building at Market and Seventh streets, San Francisco.

An Index to the Advertisements

[Index continued on Page 120.]

Praise for Ransome Company.

The Ransome Concrete Company is receiving many flattering compliments from members of the architectural and engineering profession as well as from the layman, for its high-class work as general contractors of the new Sacramento hotel building. The structure has been pronounced the best built reinforced concrete hostelry in the United States. The last number of Cement Age, the leading publication in the East, devoted to the cement interests, speaks very highly of the concrete work on this building. In a future number of The Architect and Engineer the construction of the hotel will be described and illustrated in detail. The Ransome Company has recently taken the contract to erect another large hotel in Sacramento—the reconstruction of the old State House which is almost directly opposite the hostelry just finished by them.

Adds Sprinkler Department

The John G. Sutton Company of San Francisco has added an automatic fire sprinkler department to its business and has placed a competent superintendent in charge of the same. This concern now maintains six important departments in the building construction line and in charge of each is an expert. The departments are: Heating, ventilating, plumbing, electrical work, sheet metal work and automatic sprinkling.

The Pacific Rolling Mills.

Under the heading, "Made in San Francisco," The Call recently published an account of some of the more important contracts filled by the Pacific Rolling Mills and the following extract from the article will be found of interest:

"The Pacific Rolling Mill Company is the pioneer of all the iron businesses in this city. The president of the concern, P. Noble, has been associated with the business for 40 years and his company will be remembered as the one which for a great many years was located at the foot of Twentieth street, where the Risdon iron and locomotive works is now.

"In the days when the street railroads were being laid in San Francisco old residents will remember the vast quantity of steel rails that were laid and practically every foot of the rails used in the old days was made by the Pacific Rolling Mill Company.

"When steel manufacture began its strides toward the present high standard for building purposes the Pacific Rolling Mill Company branched into that line and was the first to supply structural steel for buildings and bridges in this city.

"D. O. Mills, who was the first man in the United States to build a sky-scraper and to successfully demonstrate in New York City the value of the same, erected the Mills building in this city and placed the contract for the steel with the Pacific Rolling Mill Company. The efficiency of its workmanship was well demonstrated at the time of the fire in April, 1906, as this building withstood the earthquake and is today one of our very best buildings.

"Since that time the Pacific Rolling Mill Company has been continuing the business of supplying structural steel for buildings and bridges, and since the time of the fire has furnished the steel for such buildings as the Bank of California, Chronicle building, American Theater, Cliff House, Anglo and

ADVERTISERS' INDEX—Continued from Page 117

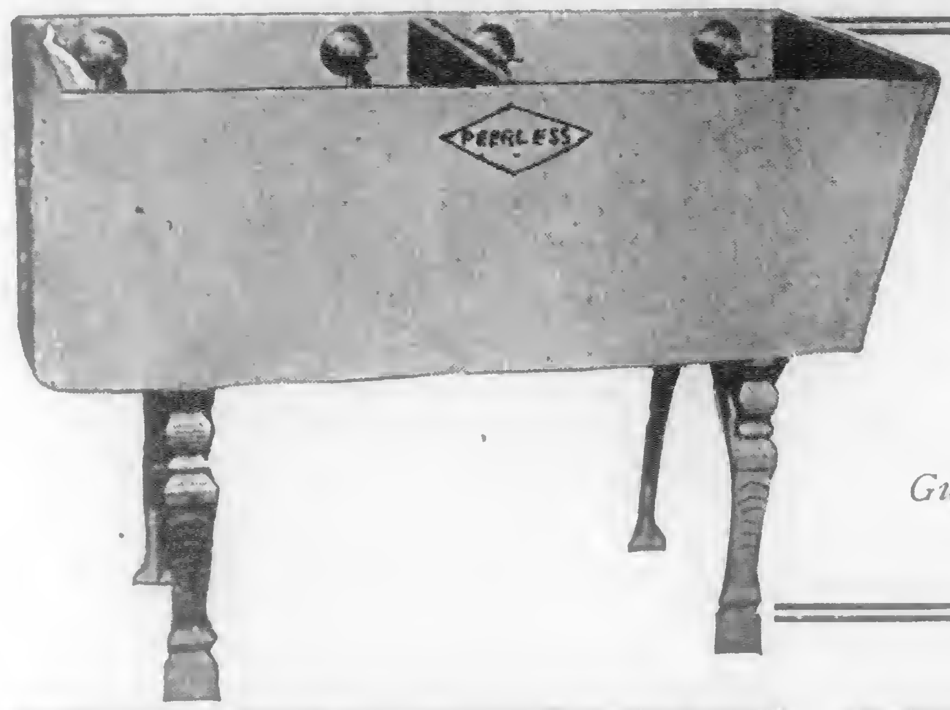
London-Paris National Bank building, Mission Savings Bank, corporation yard for the city and county of San Francisco, situated at Bay and Stockton streets, and the San Francisco hospitals now being erected in Potrero avenue between Twenty-second and Twenty-third streets. This latter work will contain about 3,300 tons of structural steel and this job covers more area than any other job of structural steel in the city of San Francisco.

"Besides the structural steel business the Pacific Rolling Mill Company operates a large cast iron foundry in which it specializes on architectural work, such as columns, bases, wheel guards, etc., although it is in a position to manufacture all kinds of cast iron."

Recent Steel Contracts.

The steel contract for the new W. A. Dorn building illustrated elsewhere in this number, was secured by the Western Iron Works of San Francisco which has already begun work on the building at Clay and Davis streets. The steel design is quite intricate. Wright, Rushford & Cahill are the architects.

The Brode Iron Works of San Francisco has secured the steel contract on the loft building that is being erected on Mission near Third street for Archbishop Riordan. Smith O'Brien is the architect.



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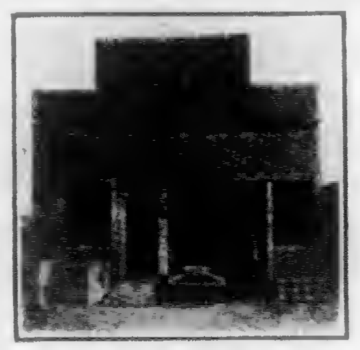
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SAN FRANCISCO CALIFORNIA

Sues to Defeat Building Ordinance.

Walter H. Linforth has made application in the Superior Court for a writ of mandate to compel the San Francisco Board of Public Works to give him a permit for the erection of a three-story apartment house at the corner of Washington and Leavenworth streets.

Because of the provisions of ordinance 243, the Board of Public Works claimed that it was illegal for Linforth to erect the apartment house so that it would reach to a height of more than forty-five feet above the curb. Linforth claims that the site of the apartment house is above the level of the street and that it will be impossible to erect a three-story building within that limit. He claims that a recent act of the Legislature annuls the provisions of the ordinance cited.

Amount of Water for Concrete.

The amount of water for a concrete of about the right consistency for reinforced work may be gaged very closely by the amount of cement used. This is a close approximation fit for field work. The weight of the water should equal the weight of the cement. Considering a bag of cement to have a weight of 92 pounds and a cubic foot of water to weigh 62.5 pounds, then for each bag of cement use 1½ cubic feet of water.

FREDERICK J. AMWEG, C. E.

M. AM. SOC. C. E.

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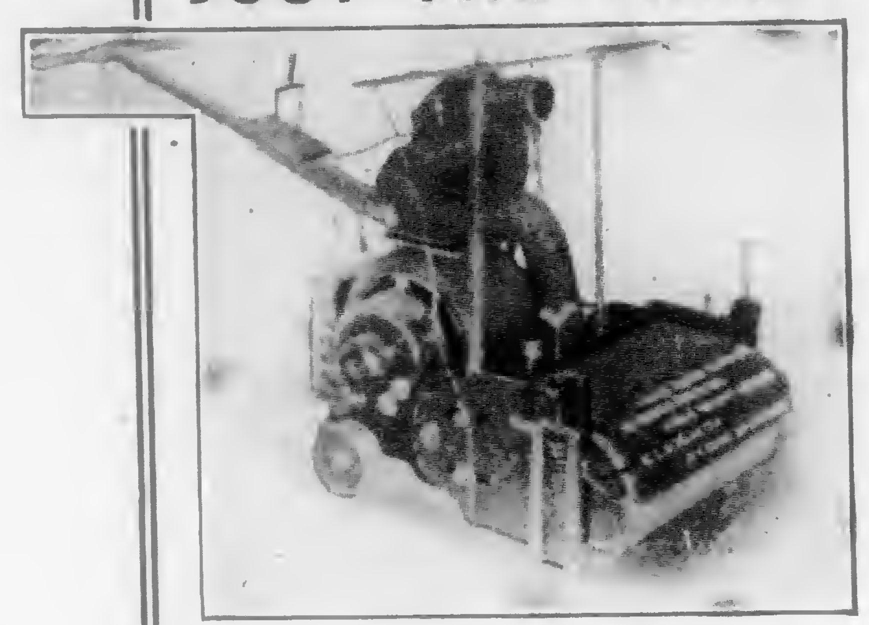
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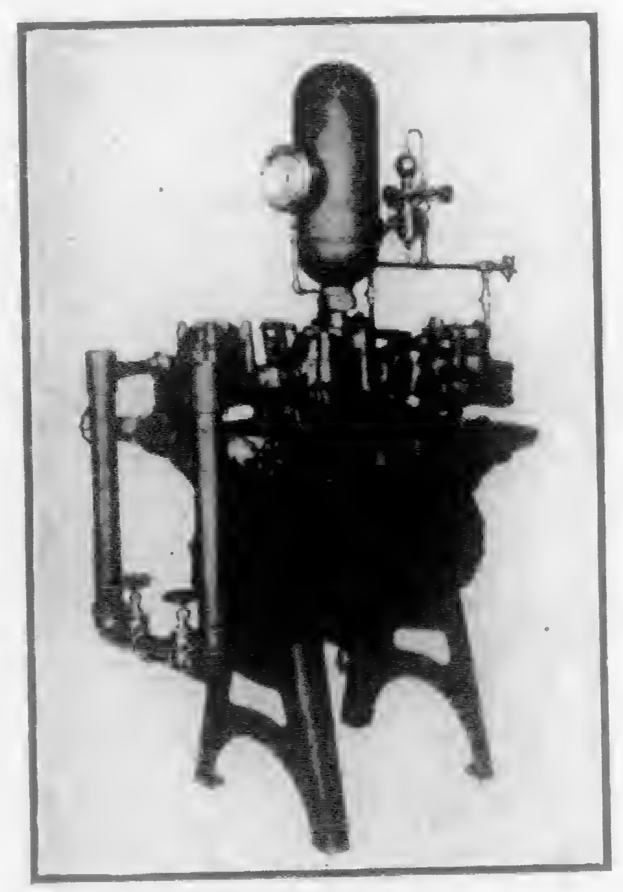
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African Mahogany for White Brothers.

White Brothers, the San Francisco hardwood dealers have recently received from their Petaluma sawmill a schooner load of African mahogany. This was sawed into lumber about a year ago, and being now in perfect condition as to dryness, they are about to place it on the market. This is the first large quantity of African mahogany to be brought into San Francisco. Africa is one of the largest, if not the largest, mahogany producing continent. The trees grow to enormous dimensions and the lumber is magnificently figured. In addition to this, African mahogany is a great deal cheaper than the Mexican variety.

Praise for Mr. Vinson.

Much credit for the success of the recent architectural exhibit at San Francisco is due Mr. M. A. Vinson who proved himself to be a splendid manager with a get-there spirit that exceeded all expectations of his co-workers. Mr. Vinson also managed the publication of the Year Book in a manner that insured the financial success of both the publication and the exhibition. Mr. Vinson is now in Los Angeles, where another book will be published in January in the interests of the southern part of the State and its architects.

Can't Depend on Momentum.

The only direction in which a train will go without motive power is down hill—and at the bottom it will stop.

What would you think of the brains of an engineer who, finding that the train was moving 60 miles an hour, shut off the steam to save coal, and trusted to the train to keep on moving to the end of the line?

Yet there are hundreds of business men, so-called, who attain a high speed, a position of eminence, and then sit back and rest, believing that competition is so far back that it can never catch up.—Journal of Decorative Art.

Brick Wall Caves In.

A peculiar accident occurred recently on the reinforced concrete building at 347 South Los Angeles street, Los Angeles, when the pressure of the third story concrete wall, not yet set, caused a portion of the adjoining brick wall of the Edison annex to give way. The contractors, the Richards-Neustadt Co., after examining the caved-in brick wall, pronounced its construction faulty, stating pressure from the concrete wall was not great enough to affect it if properly built.

Russell & Erwin's New Catalog.

One of the largest and most complete trade catalogs yet called to our attention has just been published by the Russell & Erwin Manufacturing Company of New Britain, Conn. Mr. F. D. Voorhees, Pacific Coast manager, with offices in the Commercial building, San Francisco, has received a few copies of the book and he intends to distribute quite a number to architects on the coast as soon as a substantial shipment has been made from the factory.

Some idea of the size of the catalog may be had from the statement that it contains over 1000 pages with from two to a dozen illustrations on each page. The book treats the different schools of architecture including a brief history of the hardware used in each school. Much valuable information for architects in the way of suggestions, detailed drawings of various styles of hardware and the application of locks and hardware trim, is given and this material will no doubt be appreciated by the profession as it has been compiled at great expense.

A special feature has been made in presenting data to insure a correct application of locks and trim for French and casement windows. Extra pages are provided for the insertion of additional pages as new goods are added. The half tones are beautifully done and the detail of each fixture is brought out with striking clearness. The book is handsomely bound and should prove an ornament as well as a useful acquisition to every office it goes into.

Ruins of Concrete.

At last archaeologists have advanced a reasonable theory regarding the immense ruins in Mexico and Central America which testify to the remarkable achievements of a vanished people, and one likely to be better appreciated in this age of concrete than ever before, says the Springfield (Mass.) Republican.

The new contention is that the great buildings, supposed to have been built of stone, were really created of concrete that was made in molds of gigantic size. Here is an explanation which explains, and also lies within the realm of the possible.

The difficulty that must have attended the transportation of what have been believed to be colossal stone blocks vanishes if they were really made of concrete, for which abundant material was easily obtainable. It is possible that the remote race concerned achieved better concrete construction than we have yet obtained.



Mr. Charles H. Frost

MODERN COLOSSUS OF RHODES

Who Has Promoted Good Brick Roads in California.

(From The Clayworker)

UNDER the caption, "Men of Affairs in Los Angeles," the Daily Times of that city pictures Mr. Charles H. Frost, president of the Los Angeles Pressed Brick Company, as a sort of Colossus of Rhodes, as the reader may see from the accompanying production. Mr. Frost has long been an important factor in the building world of the Pacific coast. A decade or more ago he retired from the brick manufacturing business in Chicago and hied himself to Los Angeles in search for health. He found it, and then again engaged in brickmaking, establishing a plant near Los Angeles, which has grown to be one of the largest in the country, and the output of which has gone into many of the largest structures and most beautiful homes of that section.

Notwithstanding the fact that the Los Angeles Pressed Brick Company manufactures many millions of common brick and large quantities of high-grade front brick and terra cotta, including a line of fine enameled brick, Mr. Frost found time, a year or two since, to establish a building brick plant at San Francisco, just to help out the builders of that section.

Of late years Mr. Frost has given considerable attention to brick roadways, and has succeeded in interesting the municipal officers of Los Angeles sufficiently to induce them to lay several miles of brick streets, and these brick roadways are proving so superior to the asphalt, wooden block and similar pavements previously put down that the demand for paving brick now taxes the capacity of that department of their immense plant. Knowing the care and responsibility of managing such an enterprise, the reader may judge that Mr. Frost has lost none of the Chicago spirit, and well deserves to be characterized as one of the leading men of affairs on the Pacific Coast.



Detail of Hand Forged Wrought Iron Scroll made by Chr. Deterding

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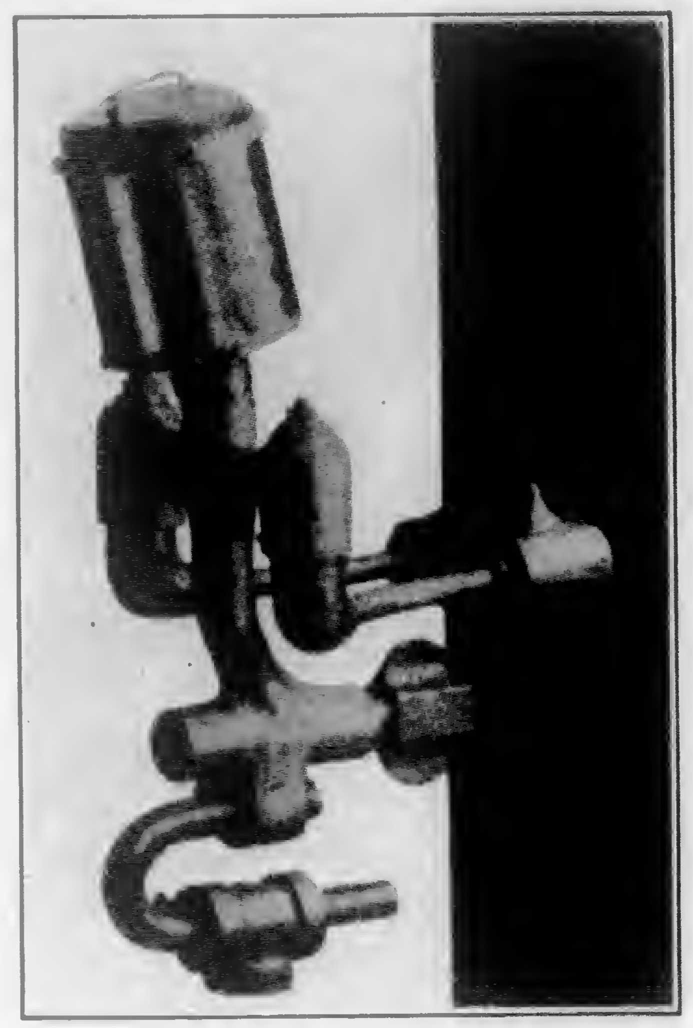
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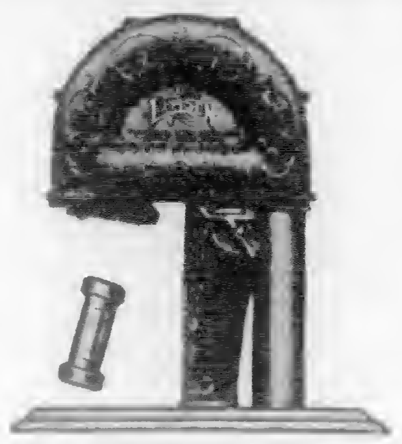
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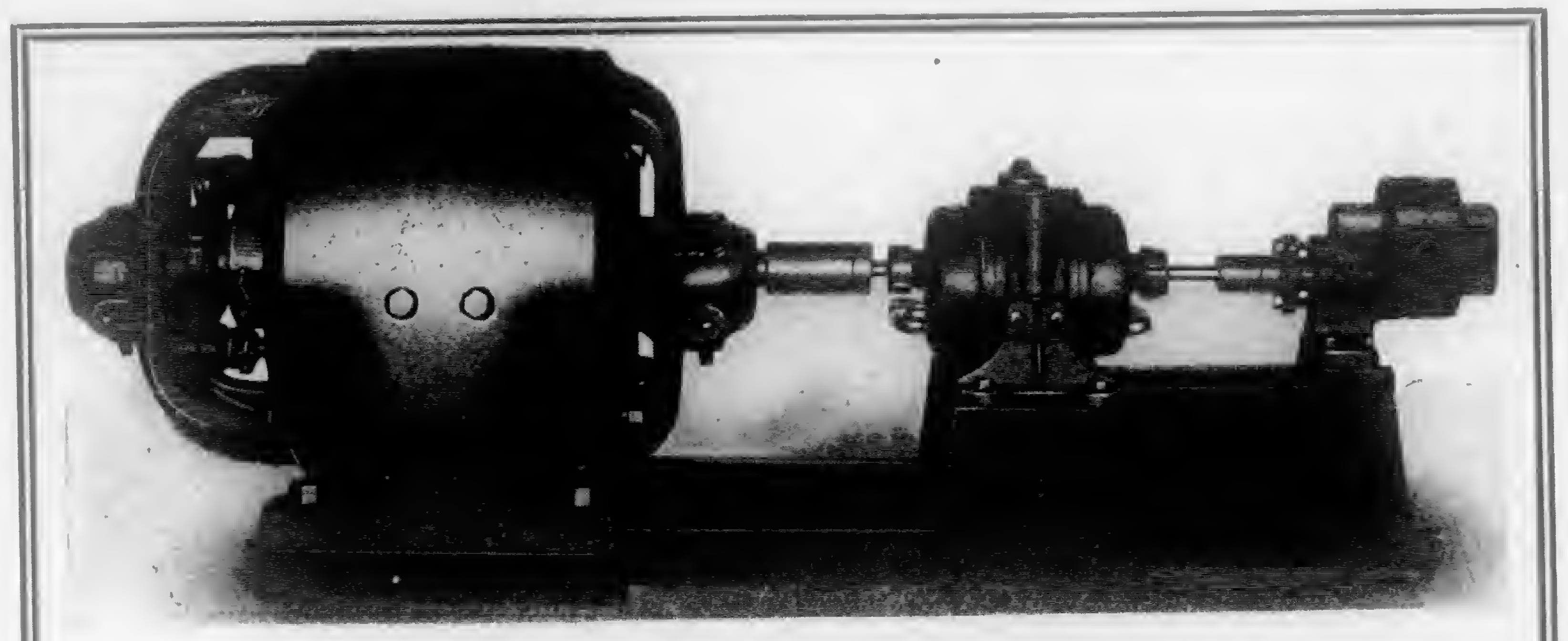
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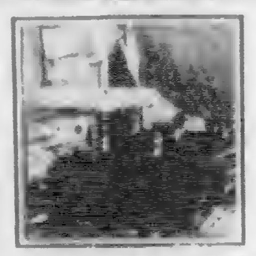
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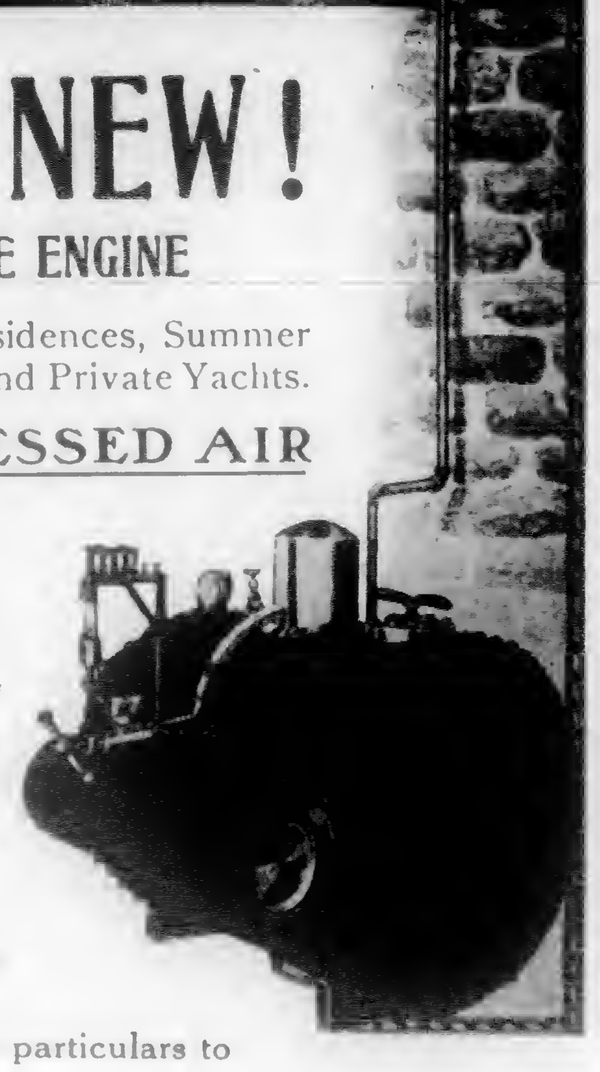


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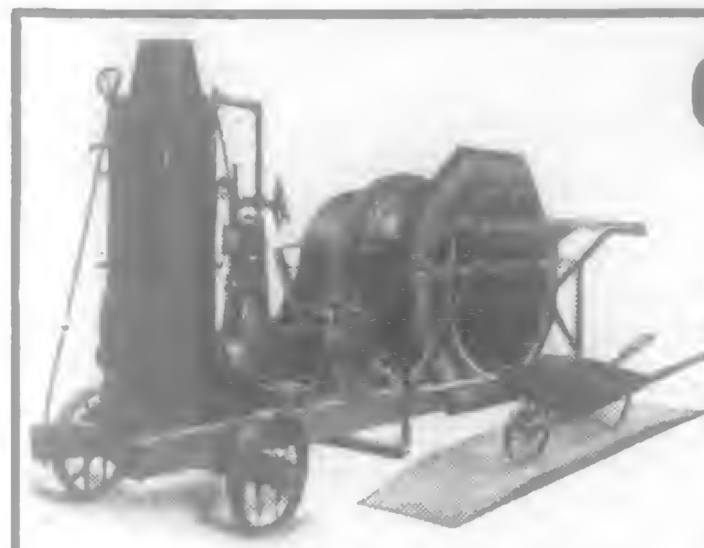
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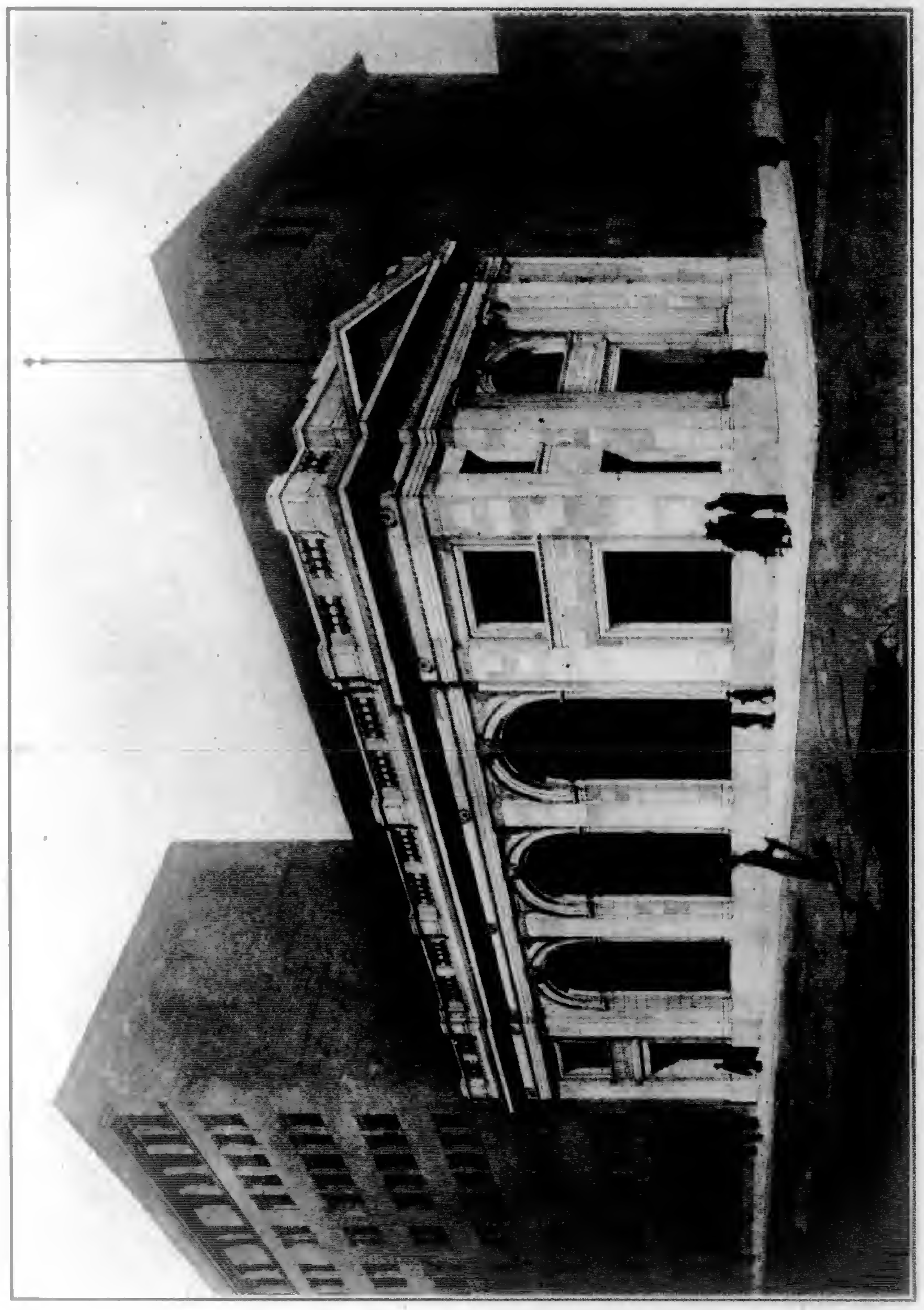
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Contents for December



SKETCH OF FARMERS AND MERCHANTS' SAVINGS BANK BUILDING, OAKLAND, CAL.
Sutton & Weeks, Architects

Frontispiece.
The Architect and Engineer of California
December, 1909

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XIX. DECEMBER, 1909. No. 2.

American Architecture

By CHARLES PETER WEEKS, Architect.*

That America enjoys a distinct type of architecture—a type demanded by local conditions— is maintained by Mr. Charles Peter Weeks, who recently returned to San Francisco from a six months' stay abroad. Just as the Greeks built Greek architecture, and the Japanese built Japanese architecture so the Americans are building American architecture. But while we are making such splendid progress towards a consistent, harmonious style, Mr. Weeks sounds a note of warning that may well be heeded—he declares we spoil some of our best work by a too familiar knowledge of old world architecture and a consequent tendency to embody as much of that knowledge as possible in our local conceptions. The result is too frequently a disappointment.

In his travels Mr. Weeks photographed more than 200 buildings and a few that are reproduced here serve to illustrate the author's argument that each country, including our own, develops its own peculiar type of architecture, characteristic of its local conditions.—Editor.



Penang Street Scene.

A GENERAL survey of old world architecture teaches a lesson. It teaches the impossibility of copying old world models, and at the same time it demonstrates the intrinsic merit of these models in showing the consistent unity of design in each country and its entire dissimilarity to each other country. The Egyptians built Egyptian architecture; the Greeks built Greek architecture; the Japanese built Japanese architecture. Although they all started from the same source whether it be Assyria or Egypt, yet in the end they developed their own peculiarities, which became characteristics.

We, today, in America are in spite of ourselves doing the same thing, are producing a like result. We are learning to study the architectural idea in the abstract; to know it in such terms as symmetry, proportion, grace, color, harmony, etc., instead of Classic, Renaissance, Egyptian or Gothic.

We have at different times copied a Greek temple for modern usages, and even a few attempts have been made to use the Egyptian temples as models, and the scarcity of these attempts proves the impossibility of looking

*Junior member of the firm of Sutton & Weeks, architects, Mutual Savings Bank Building, San Francisco.

on old world architecture in another way than as models expressing the highest ideas of beauty in the language of the nation that produced them. The great difference in architecture of the old world nations is largely due to the impossibility of close communication between them and thereby the necessity of each nation working out its own salvation without being continually hampered by its neighbors, and only limited by local conditions. We today have our old world knowledge too close at hand, but even with that handicap we are, controlled by local conditions, gradually working out our own architecture.



Bungalow at Penang.

Who can say that we in America have not an architecture of our own? Where in the world will you find structures at all like our best modern buildings? Point out to me a Columbia College Library, a University Club, a West Street building, a Singer building and a Blair building. But the men who designed these splendid structures looked at old world examples symbolically instead of literally.

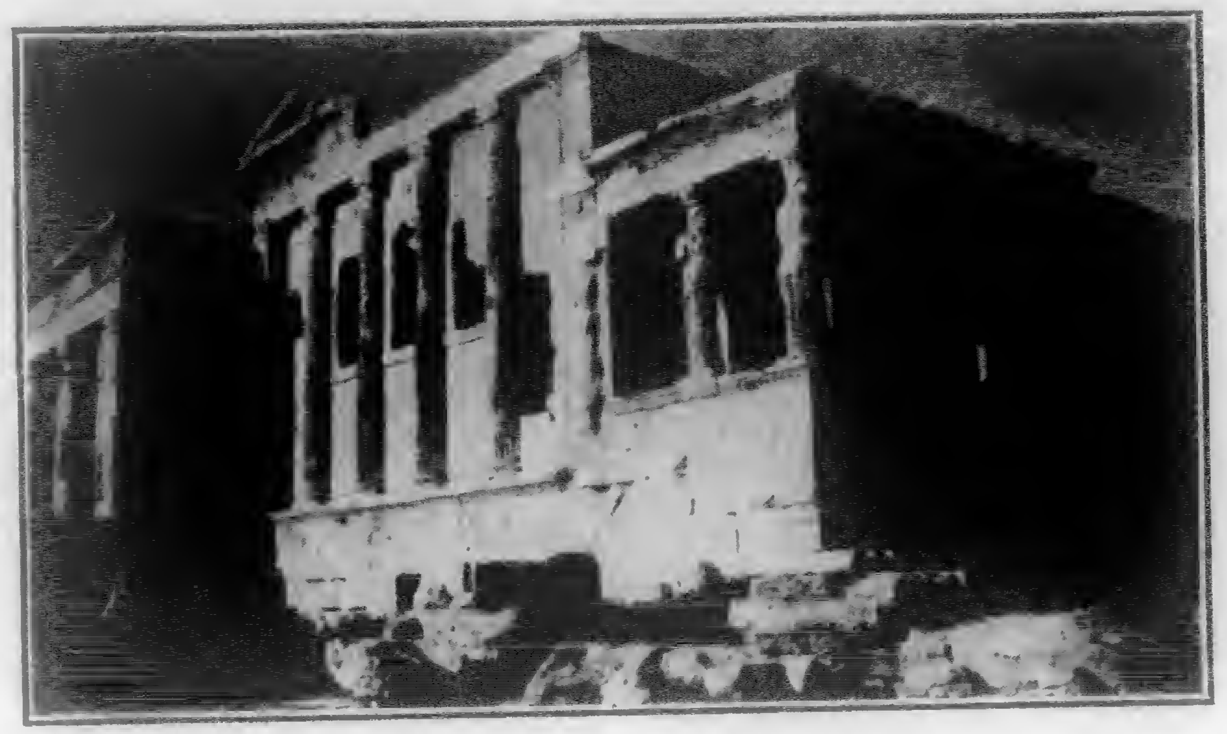
Even Messrs. McKim, Meade & White, with all their "copying" have, in every case, translated and not built in the original tongue. Mrs. Oelrich's cottage at Newport is a vast improvement over the Grande Trianon.

It is the architect who studies old world architecture literally, instead of copying the spirit of his fellow pioneer that is clogging the wheels of progress towards a consistent, harmonious architecture for America, only differing in different localities due to changed local conditions.

We, however, are committing many crimes. Our all glass first story is one of the greatest, especially here in San Francisco. To appreciate the beauty of many of our buildings, it is necessary to eliminate the first story from our mind and consider the design from the second story up. What an absurdity to build a large classic temple on top of a thin sheet of glass.

Our next serious crime, one which is prevalent throughout the United States, is that of the "stunt artist." His great object in life is to do something different. Not necessarily good, but always different. He is even consistently bad by varying his design even in different rooms of the same buildings. Unfortunately some of our best hotels and residences are examples of the stunt artist's work.

The Plaza Hotel in New York has a fine grille room, but entirely out of key with the building in which it is lodged and quite out of harmony with the adjoining rooms. And nearly all homes have a Dutch room, a Louis XIV room or some other combination equally unhappy. Why make our homes



Erechtheon Temple, Athens, Greece.



Temple of Luxor, Egypt.



Portico of the Parthenon, Athens, Greece.



Court in Chinese Temple, Canton, China

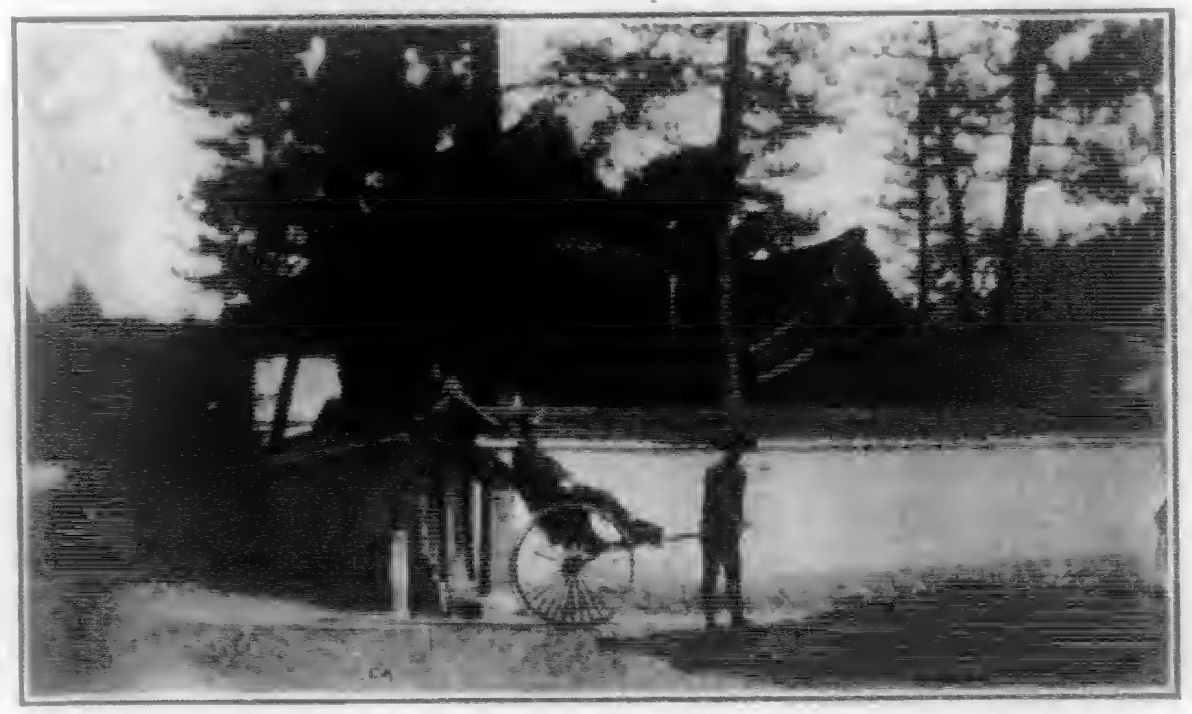
and hotels archaeological museums? Is a house so big that one kind of architecture palls on the taste? St. Peters at Rome would make a fine, dignified picture with side chapels in Dutch, L'Art Nouveau, Japanese and French Renaissance.

It is also characteristic of us to love the imported—made in Germany, fabricated in Paris, or designed in London—and we thereby nip in the bud the growing local character that tends to produce an harmonious local work of art.



Bungalo, Colombo, Ceylon.

The absurdity of this is shown by two recent examples — the Episcopal Cathedral designed in England had to be practically redesigned upon arrival of the plans in San Francisco. A palatial hostelry was designed for Oakland by one of New York's best known hotel architects. Ultimately the design was turned over to a local firm to make fit home conditions. All of this means that we have local conditions which influence our design, whether we want them to or not, and in the end will give us a local architecture in spite of ourselves, which is just what has happened to all localities of the world that have produced real art.



Japanese Temple at Kyoto.



Doorway, Chinese Temple, Canton, China.

To do good work a designer must be on the spot. He must learn the language of the native, and that language refined and beautified by careful study of the best that the past has furnished, in proportion, detail and color, in countries similar to our own, will give us locally an architecture that future generations will come to study as we go to Rome.

External color treatment had been almost entirely overlooked in this country until just recently. It deserves a great deal of study. The beauty of present European and Asiatic architecture is due to a great extent to its color harmony. And we may be sure that the ancients were lavish in color treatment as the museums prove.

But we have studied photographs and line drawings so much that the idea of color seems to have escaped us. Greece in some of her modern buildings has followed her ancient leaders both in design and color. The Library, the Museum, the Academy at Athens, are pure Greek classic and colored as did the ancients. The color application, however, has not been a success in this case, as it is coming off very fast.

Color is one of the important elements in Japanese and Chinese Architecture. The old temples are brown wood with thatched roofs, but even these have the ends of beams, etc., painted white. The more recent ones are lavish in red lacquers, black roof and metal trimmings and some parts are plaster and half timber work.

Photographs are not only inadequate to show color, but to give the true idea of proportion and scale.

My idea of Japanese architecture from photographs was that "cute little bungalow" described it. But "monumental in plan, gorgeous in color, wealthy in detail and with all charmingly set about with formal and informal gardening"



Approach to the Sphinx



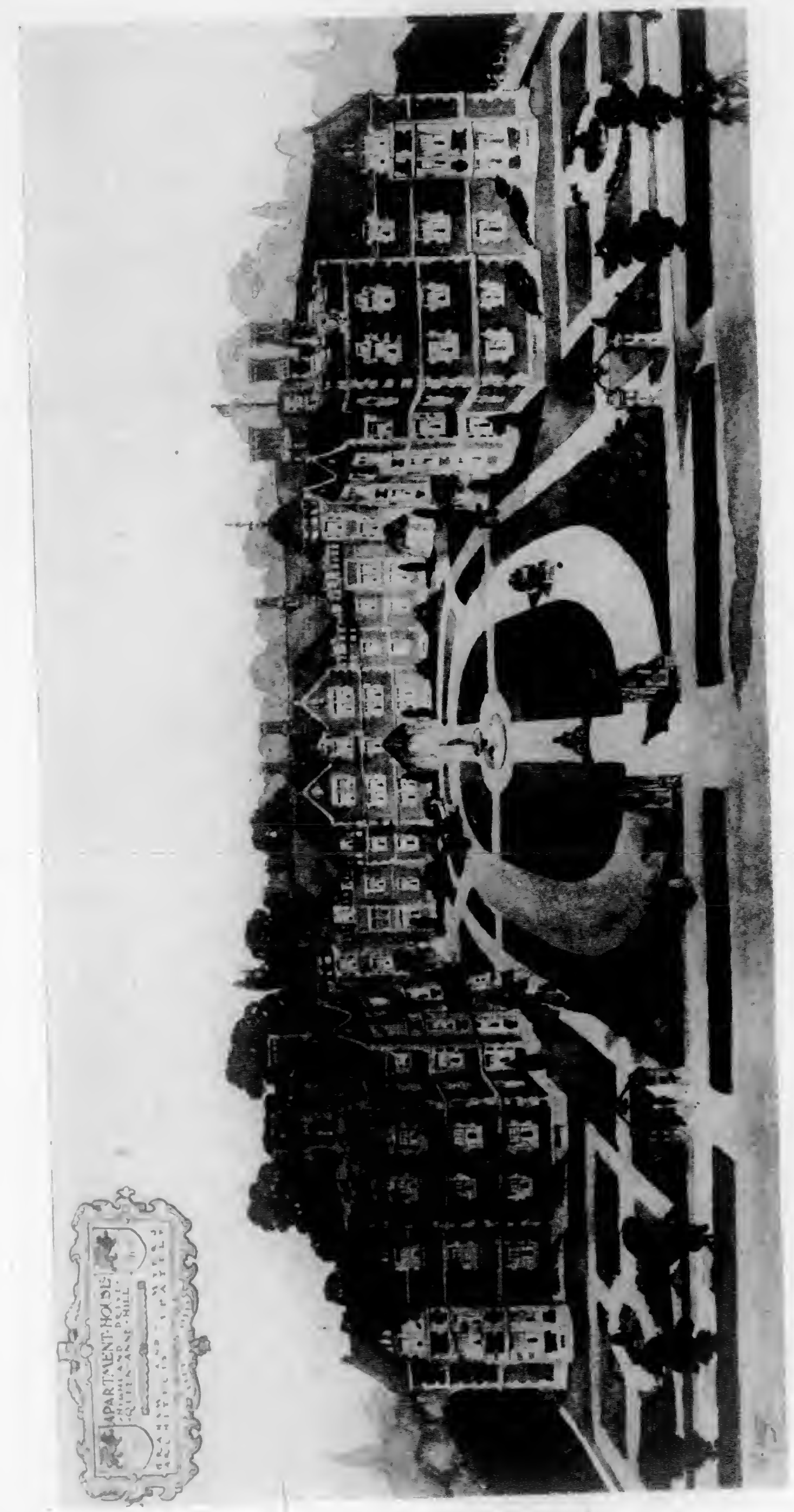
Apartment Hotel for the Sheridan-Proctor Company, San Francisco
Sutton & Weeks, Architects.

are expressions that are nearer the truth. It is surprising that people so intricate in their workmanship should be so grand in their conception.

Egypt, too, has things to tell to the eye that are kept secret from the camera. What photograph can give the feeling of immensity and ponderousness that one has from the inside of the great pyramid, and how the soul shrivels up with the sickening sensation of one who has been tricked by his best beloved dream, at the sight of the poor disfigured old sphynx, sunken in a hole surrounded by sand, sunken into insignificance by this big pyramid one has to pass to get to it!

But how stupendous is Karnack! How could one dream a vast temple planned like this in a hot desolate desert? On the other hand, Greece has a surprise that its photograph does not tell in the smallness of her architectural scale. Some temples, of course, are big but not so ponderous as the photographs show, and again some of them like Nika and the Erechtheium and Lysicrates, are charmingly small in scale. So dainty, such perfect details and yet exceedingly dignified!

It is with a shock one sees the ravages that war, time and the museum maker has created in Greece; the powder magazine that blew the Pantheon into a few scattered details and Lord Elgin's replaced clay caryatid in the Enytheon which has turned black to mourn for the one that was stolen for the British Museum. How one longs when on the Accropolis to have all the museums that have robbed this mountain of beauty of its treasures, disgorge and help the Greek archaeologist restore it to its former self. Rebuild the Partheon, complete the reconstruction of the Propyle and repair the Erechtheium, and make of Athens an architectural shrine where pilgrims from all lands will go to worship as they go now to the Stadium to witness the Olympic games.



Design for an Apartment House, Seattle, Wash.
Graham & Myers, Architects.



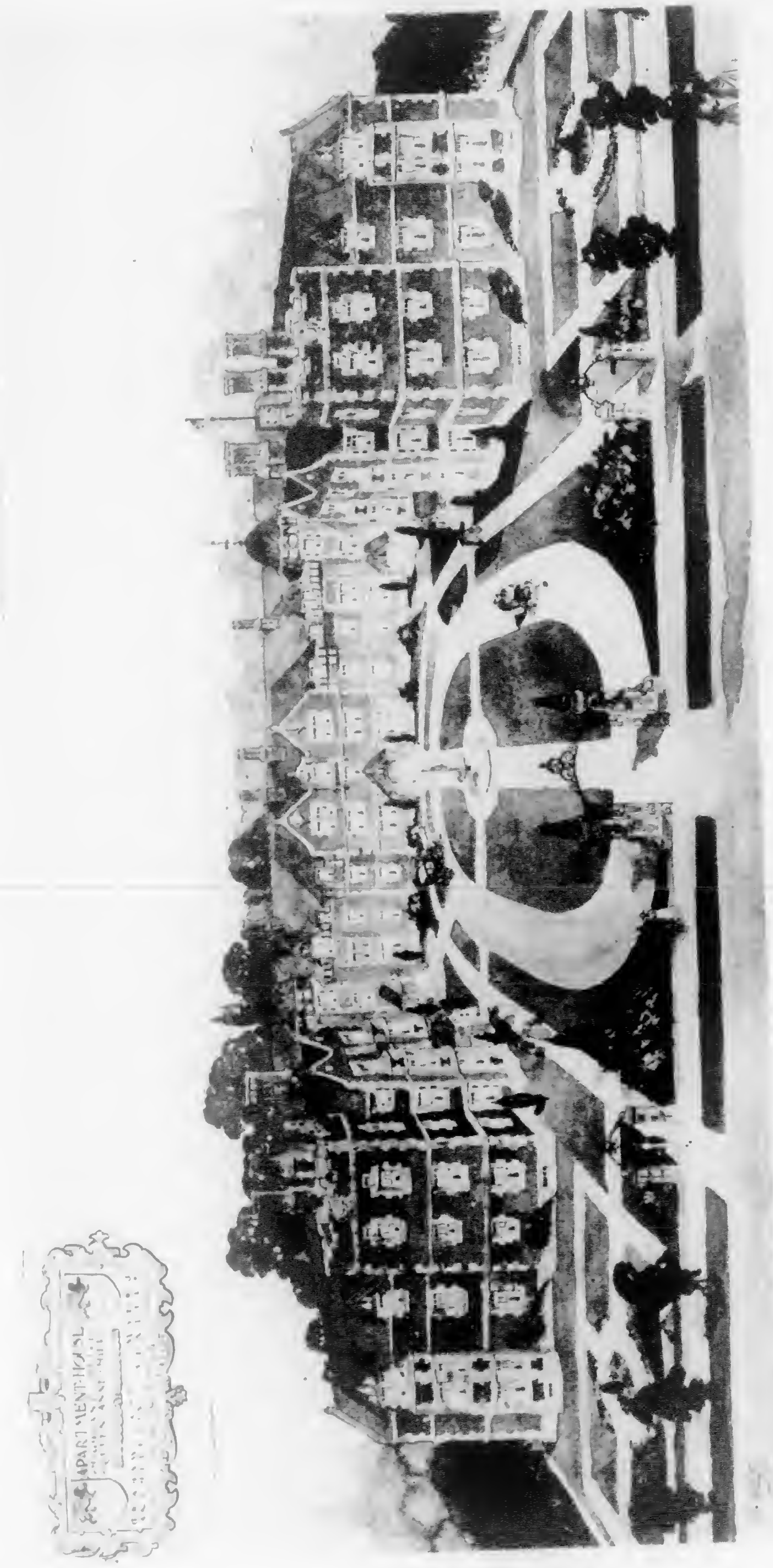
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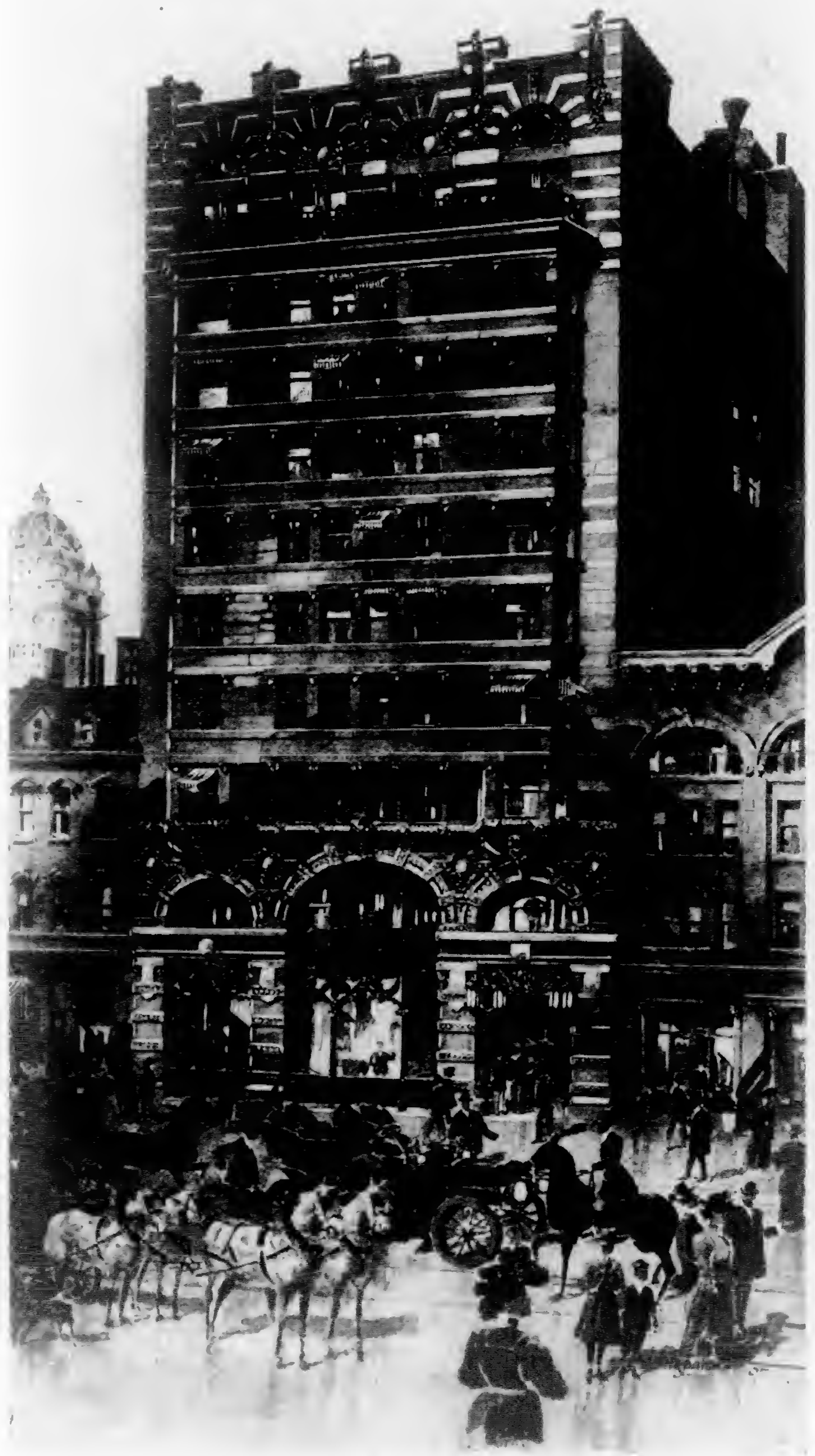
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Sketch for a Hotel.



Design for a Public Building.

An Appreciation of Architect F. W. Fitzpatrick

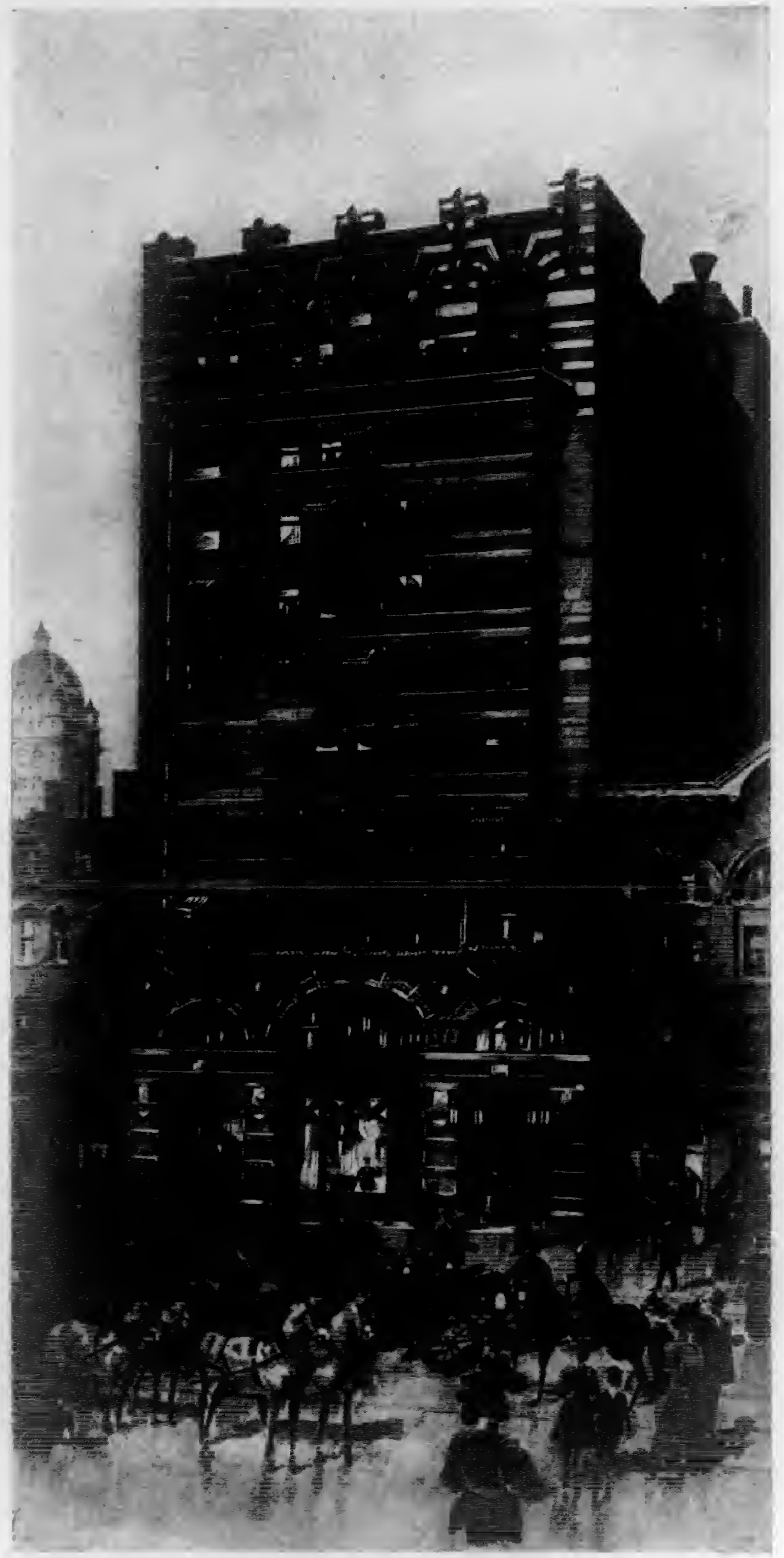
By W. TALMADGE MILLER.

Readers of the Architect and Engineer are familiar with Mr. Fitzpatrick's written and forceful contributions to these columns, but some of them may not be so well acquainted with his work as a designer. In the latter line he has but few equals, while as an architectural water colorist it is doubtful if he has any equal. We have heard unfavorable criticism of his practice in that through his assistance architects were enabled to compete with and excel others more able undoubtedly than they. This seems silly to us. These days results are what people demand. What are the odds whether a man can produce them personally or through a permanent partner, a skilled assistant or as in the case in point, through a special association with one accustomed to producing the very best results?

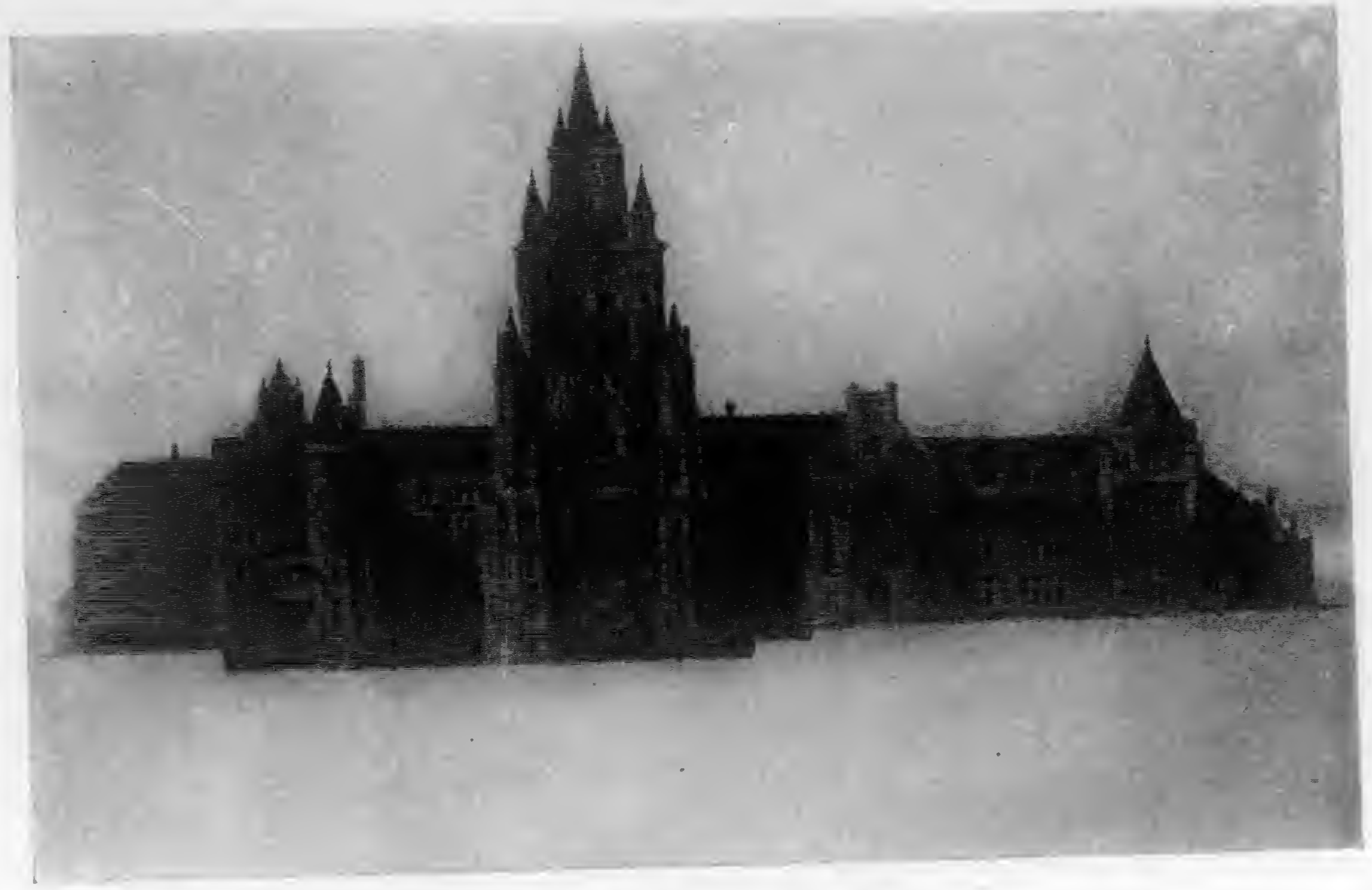
We are glad therefore to have the opportunity of publishing Mr. Miller's "Appreciation" of Mr. Fitzpatrick's work. Naturally, much of that work is confidential, but we have been enabled to illustrate this paper with a few drawings by him of designs made in known association with others.—Editor.

THAT Architecture has been commercialized during the past few years is universally conceded. Is it a detrimental change or not is another matter. It can still be artistic, but it is an artistic element applied on a business basis. Medicine, religion, law, all have been similarly revamped to conform to our practical, business-like views. And mayhap the world has not suffered so very much by the change after all.

The old time architect was first of all an artist; the practical utilities of his building, its construction, its cost and all else were of minor importance and subordinated to a beautiful exterior and to academically correct details. Today our architects are learning that the use of the building, its purpose, is of primal importance, that its cost is also a vital item, and business considerations have their full weight as well as the artistic. Indeed, the generally accepted idea of true Art is that it should take care of all those things artistically, and not be merely a dream to which the



Sketch for a Hotel.



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An Attractive Bank Building.

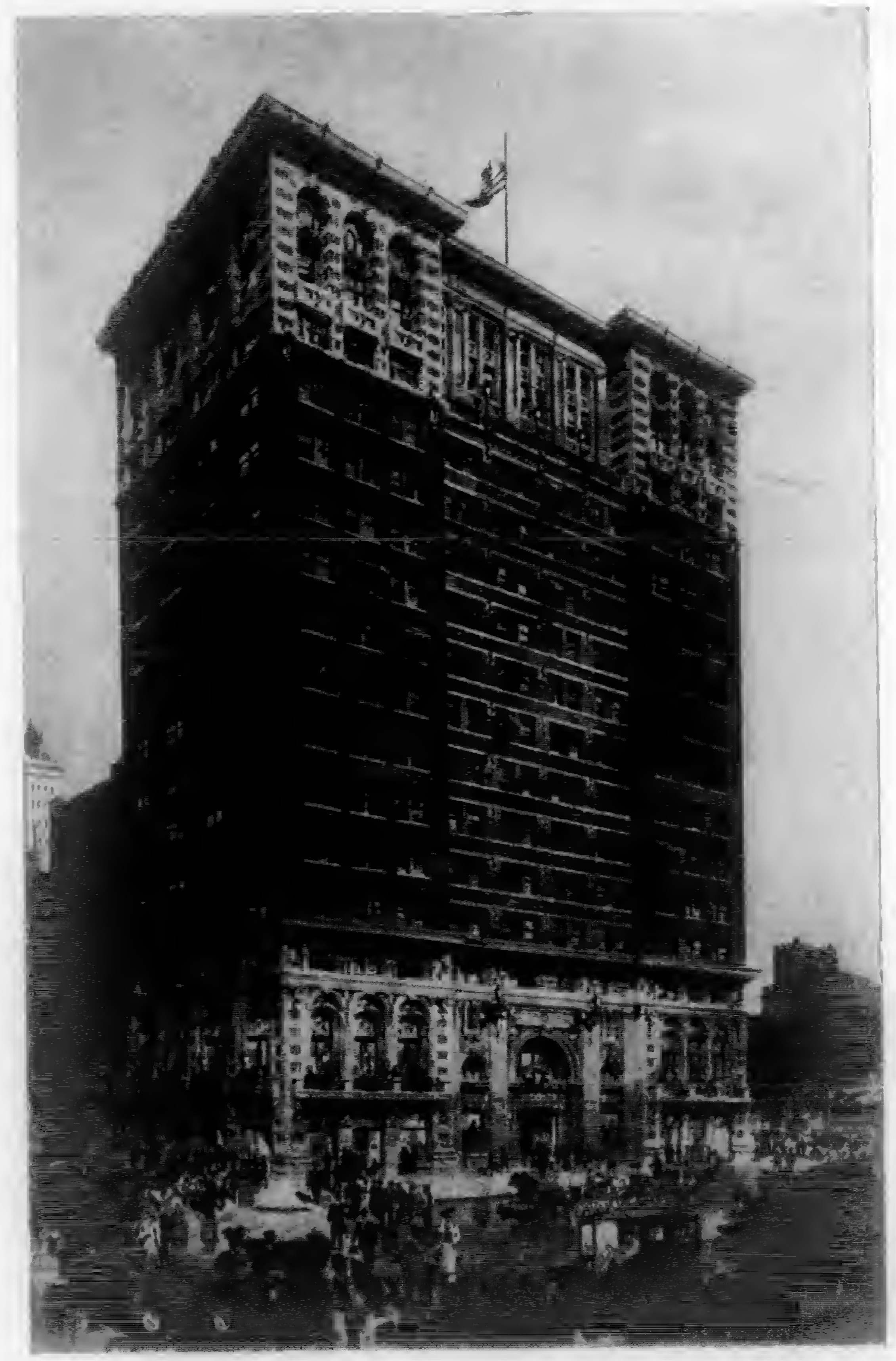
realities have to be whipped into a species of conformity. Similarly, business methods have crept into architects' offices, these are no longer "ateliers," studios filled with long-haired dreamers and tobacco smoke, but systemized business institutions where skilled specialists go about their work methodically, thoroughly, albeit it can also be done artistically.

It has been recognized that the architect himself need not necessarily be a great artist. If he is a good executive it will be better for the building, the client and his own welfare. The artistic element can be infused as a

branch of the office work, as can the engineering features, a specialization. If the artist—the designer, is an employee, well and good; if he be a member of the firm, so much the better. But the trouble is as it has always been that the clever designers, the real architects, are lamentably few and far between, while the architectural offices are distressingly numerous. Therefore, many of the latter have to get along without the former. Yet, the general public is becoming discriminating, it is growing appreciative of artistic buildings, demands them and insists upon having them though, unfortunately, its demands are far from being always complied with!

* * *

Years ago one man at least clearly foresaw all this and established a service to meet the demand. He called the new specialization or profession "Consulting-Architect" and for all I know, is still its only practitioner.

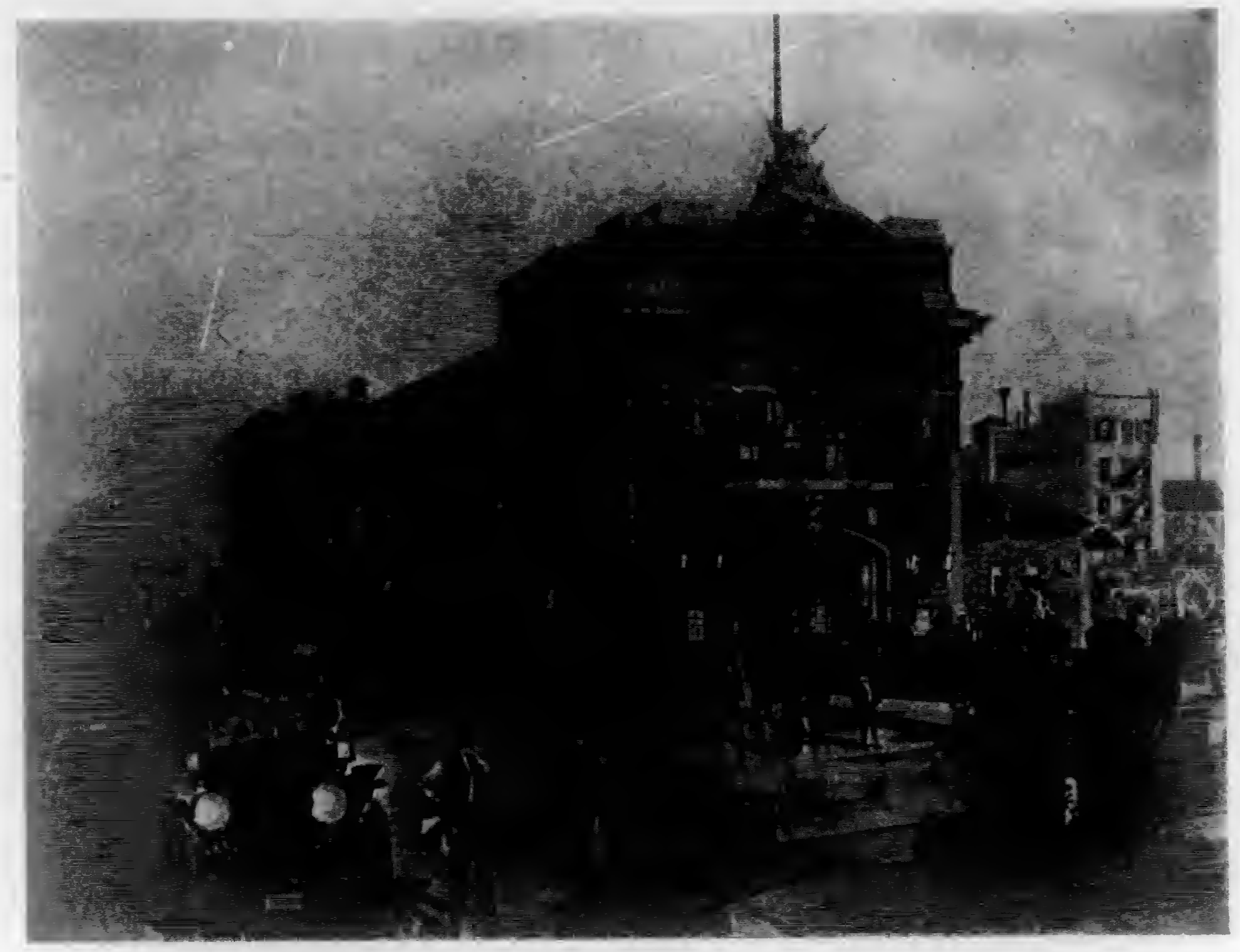


Commercial and Office Building.



Design for a Bank.

Oftentimes we hear of a practicing architect of a larger city, an older man being associated as a "Consulting Architect" with a young man entrusted with important work in a smaller city, but so far I believe that Mr. F. W. Fitzpatrick of Washington, D. C. is the only exclusively Consulting Architect in the country. He made an enviable reputation first as a practicing architect in the West, a Federal Government architect and a designer of the highest caliber before giving his whole attention to this new branch of exclusive "Consultation," so that he was no unknown quantity or experimentor. He went into it convinced that it gave the largest possible field for his talents. And it did. No man in the country or probably in the world is called upon to solve as many and as complex Architectural problems as is he. Our biggest offices turn out a surprising lot of buildings, but all these plans have to be worked out, detailed and worried over, each building is actively on the boards, as it were, for a year or more; in his case he does the preliminary studying, the actual designing, the scheming-out of the plan in rough sketches and the exterior either in rough form for the practicing architect to work out, or in a colored perspective ready to show the clients. Most of his exterior work is done directly in perspective and those pictures have every appearance of finished and most careful



An Up-to-date-Fire House.

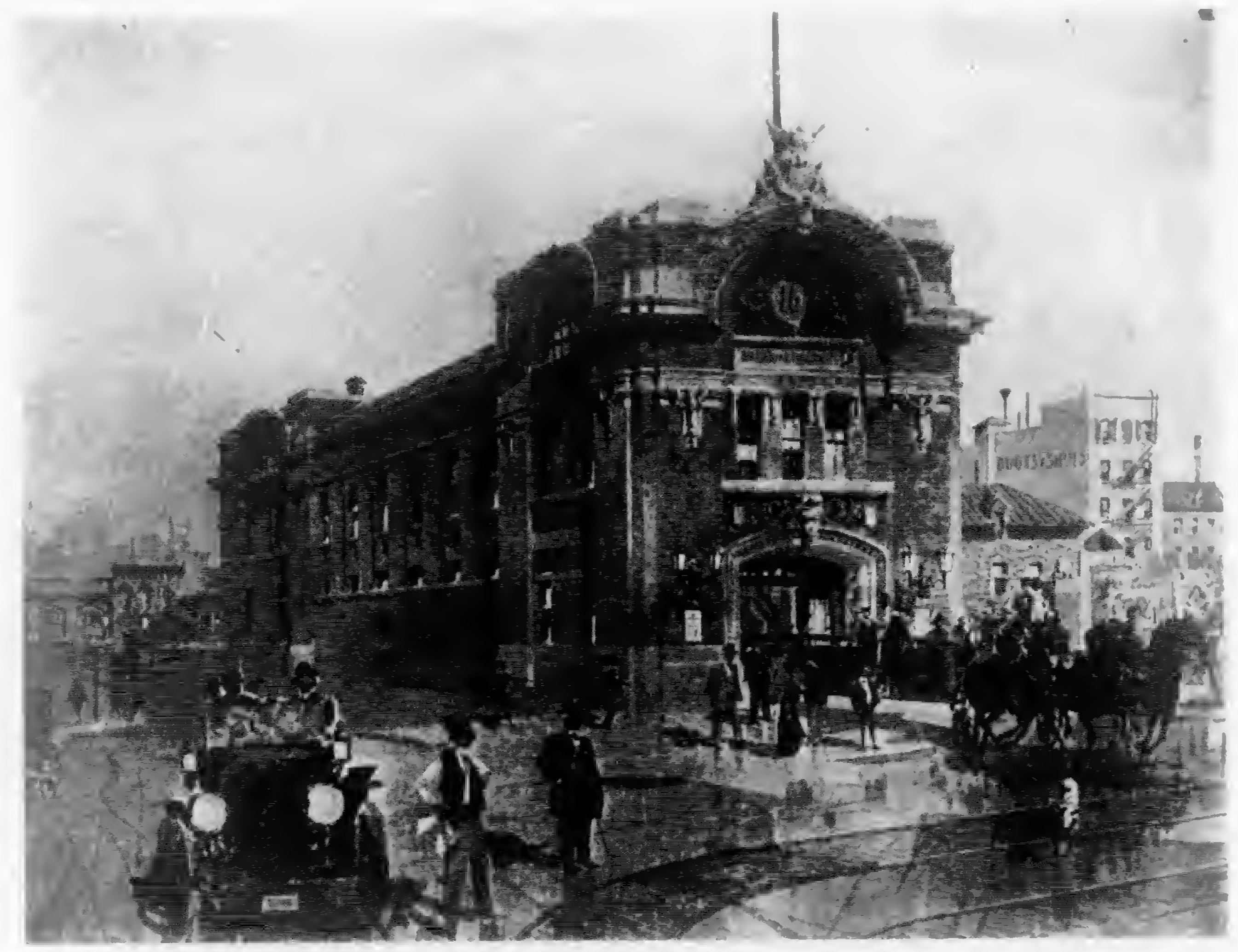


Sketch for a Cathedral.



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Sketch for a Cathedral.



Comfortable and Luxurious.

work, accurate representations of what the completed structures will look like, surroundings that people will recognize, life and city stir about them, the daintiest of architectural pictures, works of art, drawings that the very best judges have pronounced equal, if not superior, to anything that has been done in that line. They list our best known architectural illustrators in the order of excellence with Fitzpatrick first, then Guerin, Hawley and Enders.

Yet his facility, capacity for work and ready grasp of possibilities are such that he rarely has to give more than two or three days to any one building, and I have known him to reel out as many as nine, and not unimportant ones either, in a week. The big office that does twenty as important buildings in a year is busy indeed.

The amount of personal work he does is simply phenomenal, an average of over two hundred projects studied and designed every year. Yet he never gives the impression of being rushed, he works systematically and long hours, but with several hours a day of vigorous physical exercise crowded in, boxing, tennis, fencing and cross-country riding are his favorite sports and he does them as well as he does his work, his writing



An Ornament to Any City

and the many "side-hobbies" he has, such as inaugurating or participating in the fire-prevention movement, the "City-Beautiful" plans, etc. Physically abnormally strong, his life is so regular and well managed that this work and strain that would kill the average man, agree with him so perfectly that he never feels the need of or takes a vacation, claiming that five hours sound sleep and three hours of violent exercise every day constitute vacation enough for any man.

Some might think that this enforced hasty work would suffer in quality. On the contrary, his very best is spontaneous. He abhors the term "inspiration," but he must be "inspired," for it hardly seems possible for one man to do all he does and so well. Nothing in his compositions is unstudied or accidental.

His architect-clients are from every city, and not only in this country, but in Canada and in Mexico, and of late he has done much foreign work, even in remote Australia. They come to him in perfect confidence and that they always get the very best and are satisfied is evidenced by the fact

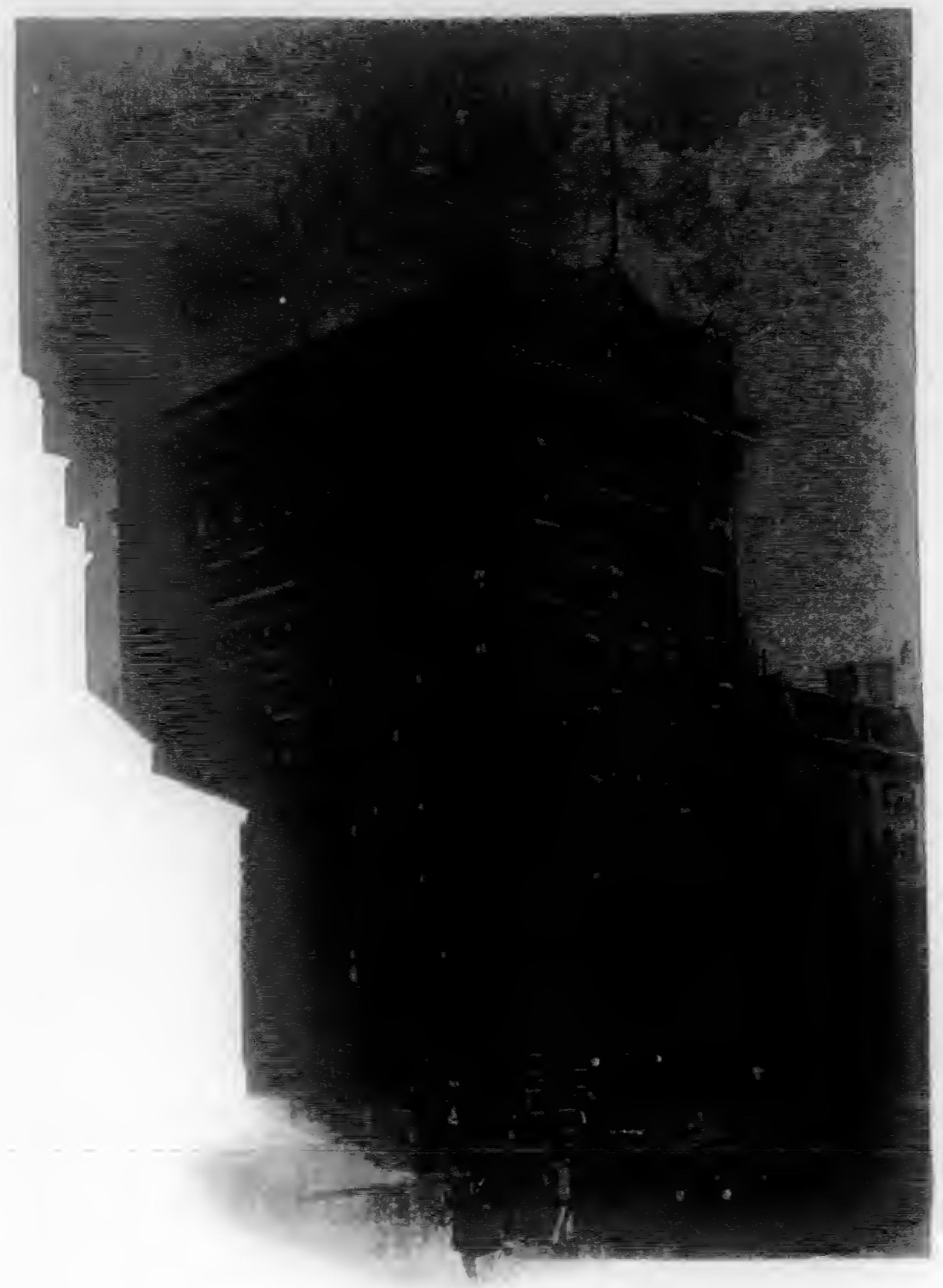


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that those who came to him years ago still turn over their important work to him. He is a good deal like a father-confessor to the profession. He knows their troubles and difficulties and is liberal in his help and every man realizes that his secrets are safe in "Fitz's" keeping.

Only lately has there developed antagonism to this man who has been so universally loved and who has done so much for the advancement of our National Art. It has undoubtedly originated in the ranks of the "big" architects. First Mr. Fitzpatrick was indirectly attacked in the English journals and those veiled attacks were then repeated here and enlarged upon, always covert, but nevertheless aimed most emphatically in his direction. The reason is evident enough. All the big work does not go to the few "big" men who have established big clientèles. Yet that which escapes them is well done. People find that there is just as much and more satisfaction in dealing with a local architect in good standing as there is in employing a big name from New York, for instance, and the resultant buildings are in many cases handsomer, more artistic than the work of those big men. The latter realize that in great measure this is owing to Fitzpatrick's association with local men, they recognize his handiwork and therefore look upon him as a dangerous rival, a man who is helping other men to prominence, to doing as well as themselves, the great ones, and these therefore resort to various expedients to efface this, as it seems to them "harmful" competition. The situation is not without its humor however, in that when sore pressed or puzzled or having a specially difficult problem to solve he is the very man they turn to for expert advice!

His practice is safely established, whatever Envy and Jealousy and the Trust Spirit may say and do. It is on broad lines, it is helpful to the many, it has contributed tremendously to a truer appreciation of the Art Architectural in this country and Mr. Fitzpatrick merits all the success and the results and benefits he has achieved as well as the gratitude not only of his architect-clients, but of the profession, yes, the nation as a whole.

* * *

A Budding Napoleon

Youthful Capitalist (aged seven)—Doing any good?

His Partner (aged eight)—Naw; I don't seem t' be able t' place this lemminade.

"Jimmy Jones selling any pop?"

"He's gettin' rich—took in fifty cents since noon."

"What's our assets?"

"Chair, table an' tumbler, belongin' t' your maw; bucket an' dipper, property of my maw; two gallons of sweetened water an' one lemon, wid de groceryman makin' bad talk about de fifteen cents we owe 'im—I tells yer, we're on de ragged edge of bustt."

"Any outstanding contracts?"

"Me brudder said he'd buy a drink, t'morrer if de Yaller Legs win."

"Good! I'll tell you what we'll do. We'll form a new company, take over this stand, merge Jimmy's, get out a prospectus and circulate it all around de street, issue bonds on the equipment, capitalize the indebtedness, issue $1 stock, half-preferred, and—"

"Den what?"

"Sell the stock to Jimmy."

"Shucks! Jimmy ain't such a darn fool as to bite at dat kind er bait."

"Ain't he? You just watch me hypnotize him!"

And it was even so, and the next day Jimmy woke up. They all do.—Puck.

The Law Regulating the Practice of Architecture*

By ROBERT MORGENEIER, Architect and Engineer.

VII. Building Contracts, Surety Bonds and Superintendency.

FOR the sake of brevity, I assume that both the owner and the contractor are competent to enter into a contract. For detailed information upon what constitutes such competency the reader can readily examine the authorities under the headings, "Law of Contracts" and "Contract Stipulations," and in further exploration consult the statutes and reported cases. At present we will note the formalities to be observed and the points to be covered in writing, after notice of acceptance of bid has been sent to and received by the successful bidder. Such notice of acceptance shall in all cases, both of public and of private work, be given in writing, and substantially as follows, viz.: "Your bid, under date of ...., 1909, duly opened ...., 1909, and offering to (here state work offered to be done), for the sum (here state the amount of the bid), is hereby accepted. You are further requested to present for examination and approval surety bonds in the sum of (here state amount of bonds), and personally appear at (here state place, day and hour of meeting), to enter into a contract agreeable to the terms and conditions under which your said accepted bid was submitted.

"(Signed)........................."

Upon the meeting of the parties there shall be on hand, in addition to the approved bonds of the contractor, three numbered sets of the drawings, three corrected and approved sets of specifications, and, also in triplicate, the building contract proper.

This contract shall, in every instance, at least cover the following declarations, stipulations and agreements, to wit:

1st. Heading, "Building Contract."

2d. Day, month and year when made and entered into.

3d. Name of owner, as first party, and his place of residence in city, county and State.

4th. Name of contractor and his place of residence in city, county and State, as second party.

5th. Stipulation that the parties thereto shall be designated as "owner" and as "contractor," singular numbers only to be used, and that the word "architect" refers to the architect whose name appears upon the drawings in writing, printing, and embossing by means of a seal, and further that the word "architect" shall include both the singular and the plural and the masculine and the feminine.

6th. Agreement by the contractor that he will complete the work in a specified number of working days, viz.: consecutive days, excepting Sundays and legal holidays.

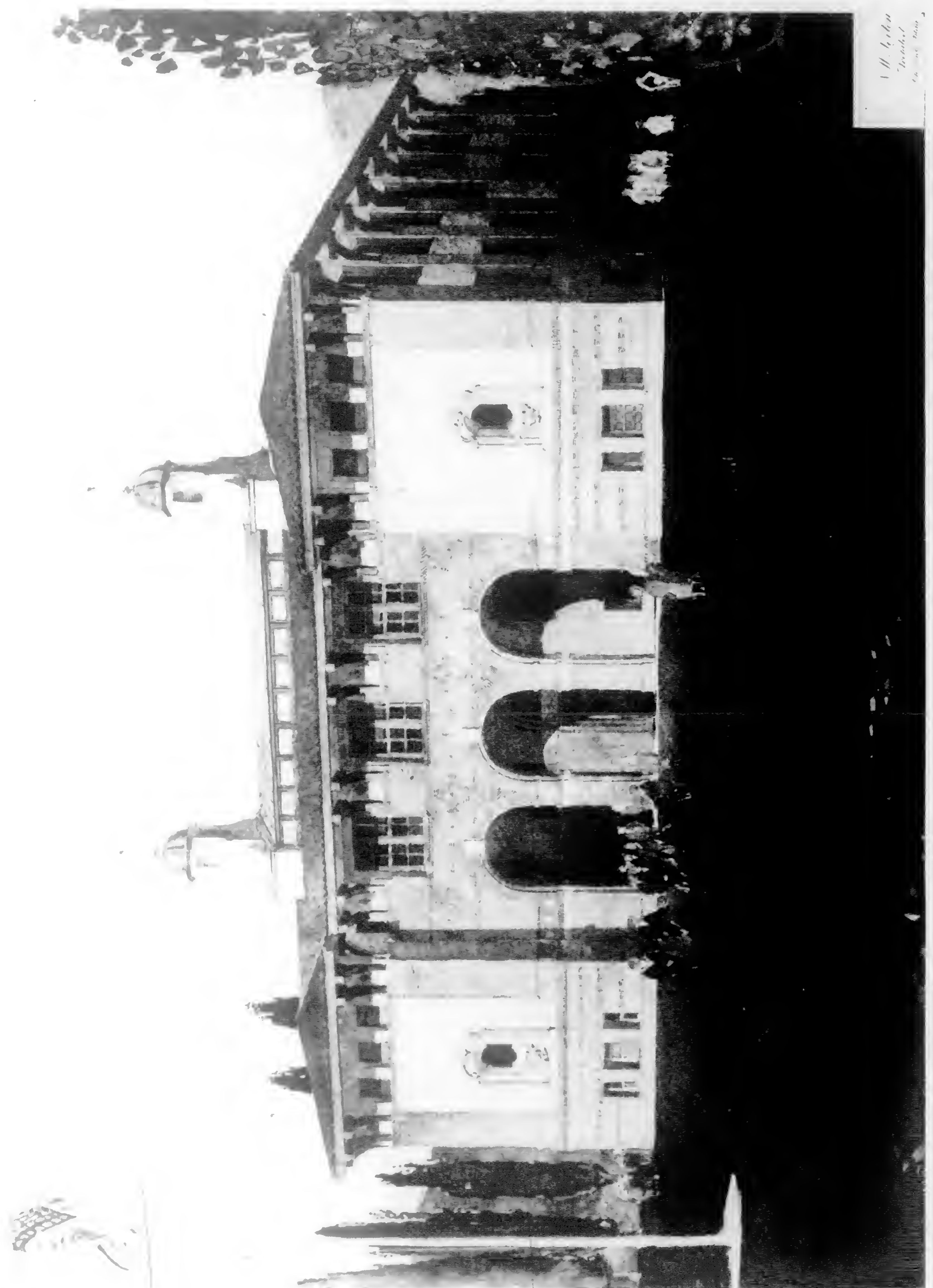
7th. Declaration of what plans, specifications and detail drawings show the work to be done, the number of sheets, and by whom made for the owner.

8th. That architect shall furnish additional detailed drawings in explanation and amplification of the adopted general arrangement plans,

8tha. Binds the architect to fairly detail and construe anything not clear to contractor.

9th. That time lost to the contractor because of the acts or neglect

*Conclusion of a series of seven articles on "The Law Regulating the Practice of Architecture." Mr. Morgeneier's business address is 30 Telegraph Avenue, Oakland.



School for Sonora, Cal. N. W. Sexton, Architect

of the owner, his agents or employees, by act of God, including inclement weather, by differences with his laborers or by strikes, shall not be chargeable against him.

10th. General description of building and exact proposed location of same.

11th. Agreement by owner, in consideration of the performance of agreement by contractor, to pay said contractor certain stipulated sums.

12th. Time of payment to follow immediately the performance of specified extent of work (or percentages of entire work done upon which specified percentages of payment shall become due the contractor).

13th. Obligation of architect to deliver certificates to contractor, entitling him to payments from owner.

14th. Specific relief for contractor if architect fails or neglects to issue certificate to contractor.

15th. Defines owner's liability if he fails to pay contractor.

16th. Declaration that title, general conditions, specifications and all drawings are part of this contract, and stipulation that they shall be so construed.

17th. Stipulation covering possible future changes of plans, and that the architect can appoint representatives and assistants.

18th. Stipulation that all work not shown and described, but which the very nature of any design or utility makes a necessary part, even though not shown or described, shall be considered as so shown and described.

18tha. That parts neither shown nor described, and which might be dispensed with, shall, if done or furnished by the contractor on the orders of the architect, be held to be new work not covered by this contract.

19th. Mutual agreement to submit to arbitration, any question, except the contract price and terms of payment, upon which the owner, contractor and architect cannot reach an agreement.

20th. Provide a penalty if contractor fails to complete the building within the specified time, and provides a bonus to the contractor if building is completed before the time specified.

21st. Determines proportioning of loss between owner and contractor, in case of fire, flood or earthquake, etc.

22d. Payments not to constitute evidence of acceptance of any or the entire work.

23d. Stipulation that architect shall continue work, if abandoned by contractor.

24th. Contractor declares that he has examined all plans and specifications, understands them, certifies to their sufficiency and declares that he will execute them in full, without extra pay, except as specifically provided.

25th. Signatures and seals of parties.

In the California practice the above twenty-five essentials have been assimilated, more or less, and quite generally adopted. Of printed forms, "Hardy's" No. 510 and "Crocker's" Form A No. 468 contains them in workable shape, and the architect should have one or the other form before him when framing any contract, being careful that such contract be bi-lateral only, but with all the powers and rights of a referee reserved to the architect.

To further join the plans and documents and additional to the cross-references contained in the same, the owner and contractor shall each sign his name to every sheet of drawings and all blue prints. Such signa-



School for Sonora, Cal. N. W. Sexton, Architect

of the owner, his agents or employees, by act of God, including inclement weather, by differences with his laborers or by strikes, shall not be chargeable against him.

10th. General description of building and exact proposed location of same.

11th. Agreement by owner, in consideration of the performance of agreement by contractor, to pay said contractor certain stipulated sums.

12th. Time of payment to follow immediately the performance of specified extent of work (or percentages of entire work done upon which specified percentages of payment shall become due the contractor).

13th. Obligation of architect to deliver certificates to contractor, entitling him to payments from owner.

14th. Specific relief for contractor if architect fails or neglects to issue certificate to contractor.

15th. Defines owner's liability if he fails to pay contractor.

16th. Declaration that title, general conditions, specifications and all drawings are part of this contract, and stipulation that they shall be so construed.

17th. Stipulation covering possible future changes of plans, and that the architect can appoint representatives and assistants.

18th. Stipulation that all work not shown and described, but which the very nature of any design or utility makes a necessary part, even though not shown or described, shall be considered as so shown and described.

18tha. That parts neither shown nor described, and which might be dispensed with, shall, if done or furnished by the contractor on the orders of the architect, be held to be new work not covered by this contract.

19th. Mutual agreement to submit to arbitration, any question, except the contract price and terms of payment, upon which the owner, contractor and architect cannot reach an agreement.

20th. Provide a penalty if contractor fails to complete the building within the specified time, and provides a bonus to the contractor if building is completed before the time specified.

21st. Determines proportioning of loss between owner and contractor, in case of fire, flood or earthquake, etc.

22d. Payments not to constitute evidence of acceptance of any or the entire work.

23d. Stipulation that architect shall continue work, if abandoned by contractor.

24th. Contractor declares that he has examined all plans and specifications, understands them, certifies to their sufficiency and declares that he will execute them in full, without extra pay, except as specifically provided.

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tures to be written with ink upon the face of said drawings and blue prints.

Filing of Public Record.

Immediately the signatures are attached one copy of the plans, specifications, and contract shall be filed, at the County Recorder's office, City Clerk's or Town Clerk's office, whatsoever may be the proper place of record for the particular case. Outside of the architect's residential county his certificate shall be placed on file with the Clerk of the county in which the building is to be erected, and in each case a registration fee of $5 must be paid, this in addition to the filing fees.

No work shall be done by the contractor or his agents upon the building site before contract is completed as above.

Contracts for less than $1,000 need not be filed, to make them valid, but any contract of that or a greater amount must be filed. See Willamette S. M. Co. versus Los Angeles C. Co., Calif. 49, Pacific Reports, 629, 1892; Schweisau versus McMahon, Calif. 42, Pacific Reports, 1065, etc.

Security Bonds.

The purpose of a bond is to guarantee the owner against loss because of any breach of contract on part of the contractor, hence the bond must be in a sufficient amount and issue from a financially reliable source.

It must also be correctly drawn and worded. Bonds are of two kinds, viz.: personal and corporate surety. The latter has, for good and sufficient reasons, practically superceded the "personal bond."

A personal bond is that given by some friend of the contractor. It is given as a matter of accommodation. It is supposed that such bondsman has property sufficient to protect the owner in case of loss due to the fault of the contractor, but the owner has no hold upon such property until a loss actually occurs. In the meantime the bondsman may dispose of or secrete his property. On the other hand, a corporate security bond is issued on a purely business basis, the contractor paying a premium, and also showing such surety company that he has property of his own and is otherwise responsible.

A surety company makes provisions to meet its losses. Judge MacPherson, of the United States Court, Eastern Dist., Pa., has recently reviewed this question so thoroughly that it may be well to repeat it here. The learned jurist, in part, says:

"The individual surety as formerly known was usually a relative or friend who had confidence in the principal, and voluntarily assumed the obligation of answering for the latter's faithful performance of duty. I need not speak of the individual who became surety for pay, for the very name 'professional bailgoer' is a reproach to every branch of the administration of justice which he was allowed to contaminate with his presence.

"But the voluntary surety, however honest and well qualified at the time of his approval by the court is liable to the contingencies of business, the changes of value in property, and the inexorable chance of death, which brings his estate into the administration of the law under wholly changed circumstances.

"Of the happening of any of these contingencies the only person in position to keep close watch is the principal, and his interest is averse to making known any doubt as to the sufficiency of his friend, or to assuming the burden of finding a new surety. These are some of the disadvantages even of an honest surety, and if we add to them the risk of a dishonest one, who may dispose of his property on his own scent of danger

or on a friendly hint from his principal, we may have a fair idea of the dangers of which our reports present many illustrations.

"On the other hand, the surety company must have a capital, the amount, nature of investment and management of which are known, is at all times subject to visitorial power, and finally, it has the sharp incentive of prevention of loss by looking closely after the administration of his trust by its principal for whom it has become responsible, not from friendly personal confidence, but as a strict business venture.

" 'Corporation suretyship is another product of modern thought and ingenuity, and may be said to possess many advantages over individual bail or security. . . . Our daily experience has proved that corporate security and the oversight and management by expert officers of the trust and security companies are highly advantageous not only to the fiduciary, but to all the parties interested, whether creditors, legatees or distributees.' "

Accepting a bonding company as bailee offering the greatest security to the owner, there then remains the question of the amount of security which shall thoroughly protect the owner.

It should never be excessive, for in the end the owner pays the premiums, viz.: in estimating the cost the contractor takes into account the cost of his bonds and adds this amount to his bid.

In no case should the general bond be greater than 50 per cent of the contract amount, and when payments are so stipulated that 50 per cent of the amount to be paid is still in the hands of the owner at the time he is to accept the finished building, and of this 25 per cent is to be paid thirty-five days after acceptance of the building by him, then a bond equalling 25 per cent of the contract price will be sufficient.

Where the architect is competent and superintends the work a contractor cannot default to the extent of 20 per cent without early detection, when steps can be taken to avoid a loss.

It has become a practice to ask a 25 per cent bond to secure the payment of materials entering into the construction of a building.

The cost of both bonds is more than offset by the assurance against loss, and, furthermore, a contractor able to furnish bonds is certainly himself more responsible than one who cannot. The architect should be satisfied of the commercial standing of the bonding company offering their surety and see to it that the bonds of different companies run concurrent and are technically correct.

Fire and Casualty Insurance.

For the protection of owner and contractors these two assurances should be acquired, the premiums of which are quite nominal, the first being at a low rate for the work as it goes up, the second is based upon the monthly pay of labor employed, and the premiums are properly chargeable to the contractor.

In regard to the obligations of an owner toward a bonding company, it may be said that the first and most important of these is his duty to notify such company, without delay, of any default on part of the contractor. And it is the duty of the architect superintending the work to so notify the bailees, upon his own initiative, and if he fails to do so is properly amenable to the owner.

Superintendency.

Superintendency on part of an architect consists in that attention, council, advice and orders which shall be found by him necessary to insure



Landry C. Babin Building, San Francisco
Crim & Scott, Architects

the construction of a building in conformity with the plans previously prepared by him.

This attention, etc., he may personally perform, or he may appoint a competent superintendent to take his place. If the work is extensive he may appoint inspectors of materials, engineers, clerks and overseers, retaining only the general supervision of the work.

The owner should understand that the architect is not a sort of foreman whose business is to personally and possibly daily direct the building operations. Under the law, and the ethics of his profession, he is held responsible for the sufficiency of his plans, and, condensed to a sentence, he is to see to it that his plans are carried out, within the limits of the contract price, and in conformity with the law regulating building operations.

In pursuance of this obligation then he will be present or represented by one who is his equal professionally when the foundations are laid out and the various first levels fixed, and thereafter at every important epoch. Before each craft takes up its work he will have his details ready; in fact, he will anticipate their entry, so that the work will not be delayed. He will give early notice to the various inspectors, and in every way facilitate inspections; he will pass upon the quality and finish of all visible parts and of every item of utility or embellishment; he will promptly and intelligently co-operate with the contractor in all things, and in case of default by the latter will serve written notice on the sureties. Take over and complete the work left unfinished by a contractor, and, having in view the rights and equities of both parties, issue certificates for payments to the contractor, and, upon completion of the job, he should know approximately what the total expenditures were and how much is still unpaid. If he has contracted to audit the contractor's bills this knowledge is readily obtained. If not, material men and sub-contractors will gladly furnish it.

All notices and orders shall be in writing, and upon acceptance of the building by owner such acceptance shall at once be published in the nearest newspaper. If at a county seat, then in an "official paper." The form of such notice is provided by statute in California, as well as in other States. If superintendency requires the architect to travel outside of his place of residence his contract with the owner should provide for the payment of his mileage and per diem expense, in addition to a fixed compensation for each and every trip to be made.

If no understanding on this point exists then the prospect for trouble is open. The owner will probably demand an unreasonable number of visits and the architect will attempt to minimize them. At all events, if the owner knows that he must pay for every trip made by his architect he will not insist upon them unnecessarily.

Of trips, expenses and services additional to a contracted percentage of the costs the architect shall keep an itemized account and render same to the owner once a month.

If the "General Conditions of the Contract" contain the word "architect," or if the drawings are marked as coming from an architect, by having such word follow the name of any person or persons, it is assumed, under the law of California, that such "architect" is duly certificated to practice in the State, and if it should prove otherwise such person or persons are liable to prosecution and a fine of $50 to $500.

Also, a non-certified architect cannot by process of law collect a bill for services covering architectural superintendency performed by him. It should be well understood by private parties, and public officials as well,



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Also, a non-certified architect cannot by process of law collect a bill for services covering architectural superintendency performed by him. It should be well understood by private parties, and public officials as well,

that if they engage the services as architect of one not licensed to practice architecture, that the word "architect" shall not appear on the drawings nor in any part of the specifications or contract.

The unauthorized use of the term "architect" in a building contract or upon the drawings forming part of such contract will, under a test at law, certainly void such contract. It is not usual to exact a guarantee of sufficiency of plans and specifictions from a contractor, for the very good reason that many architects allow a contractor to begin operations upon insufficient and incomplete plans. If, however, the plans, etc., are complete and sufficient throughout this guarantee of sufficiency should be insisted upon, if for no other reason than the one that it effectively cuts off all attempts of a contractor to substitute new and untried schemes or materials, devices, as a rule, to lower the cost.

When sufficiency is not guaranteed by the contractor and an insufficiency is disclosed, any extra cost arising therefrom must be met by the owner. If work or materials enter into a building by order or with the consent of the architect, and which was not provided for in the original contract, then such order or consent must be in the form of a special contract by and between the contractor and the architect as representative of the owner.

If a part shown and described is dispensed with and a new part is substituted of equal or different cost such change or substitution requires a written contract.

No substitution of one material for another, or of one design for another, can be stipulated by and between the architect and contractor without the consent of the owner in writing, and such a consent shall be a special consent in each and every case.

Many valuable treatises on the duties and obligations of superintendency are in print. Of these, "Richey's," for example, should always be in easy reach.

In now closing this series of necessarily elemental sketches of a complex and highly important subject, I would once more urge the serious study of the law of operations preliminary to construction, as well as general architectural and engineering jurisprudence upon every one desiring to excel in the profession.

* * *

Concrete Floors Not a Success for School Houses

RECENT experiments by a number of California municipalities have demonstrated the impracticability of bare concrete floors in school houses. If covered with wood the floors are entirely satisfactory but the cement without a covering has been found undesirable from many view points. Students complain that the concrete floors are cold and damp and many cases of sickness are attributed to them. Teachers say the cement floors are not only cold but are extremely tiresome to the feet, especially if they are obliged to stand a good deal. Some teachers have found it necessary to place rugs or carpet under their desks while others have improvised temporary wooden platforms. In the new San Francisco schools and in the high school at San Jose so many complaints have come from teachers and students that the officials are determined to provide a remedy. To this end the City Architect in San Francisco has been instructed to build wooden floors over the concrete surface at an extra cost of $1,000 for each building.

Some Needed Reforms in Contracting

By FRANK MILES DAY

Former President of the American Institute of Architects

IT is told how Brunelleschi designed scaffolding used by the workmen; that he invented necessary machinery; examined clay and bricks, and watched the stone; that he made models of clay and wax—and even of turnips. He made a scale of wood, hiring a joiner to assist him, and, as the story goes, was allowed about ten dollars, in our money, for the model.

And about this time occurred, not the first, perhaps, but one of the first "strikes" of working men. The masons, who had been building the Duomo, said: "See, we are the only ones who know." Their wages had been doubled, and yet they wanted more, and Brunelleschi refused it them; whereupon they "struck"—laid down their tools and refused to work. Next morning Brunelleschi had ten Lombardi there, and he showed them how to set stone; supervised the work until they became proficient. And then the "strikers" came back; saw what had been done, and offered to return to work. They came back again, and went to work at the wages first offered them. This occurred over five hundred years ago. It shows the intimacy which existed between the designer and the workmen—the architect and those who executed his work.

This relationship is changed under our present system of building. The modern system sees a divorce between the architect and the master builder. The architect of today puts down his ideas on paper, and has merely to see that his designs are carried out, yet he is not the executive builder.

The general contracting system is with us. It has its advantages and its defects, and they concern architects and builders. My opinion is that throughout the country something is wrong with the general contracting system. Let us look at the advantages of the system: To the man who builds it brings fair compensation; the owner knows what it will cost him to build. The architect, as his "watchdog," sees that the work is done and done right. Now, this general contracting system is well grounded in America. We have the evils of the system enforced upon us. If all general contractors were men of property, skill, and probity, all would be well and good. But we have all kinds of general contractors. A reliable, reputable contractor has to bid against an irresponsible, and perhaps unscrupulous contractor. Another defect of the system is that the owner has to entrust work to a man whose interests are not those of the owner. The owner is apt to set up a man who has his own and not the owner's interest at heart. This man may have no organization of skilled workers; no executive ability; and the work is done by sub-contractors.

I have six plans to offer in correction of the evils of the present day general contracting system. First, choose general contractors of honor, high integrity, and well equipped by education and experience to carry on building work. The owner should select such a contractor, but he goes by bids. We should insist that we get the best contractor we can. Second, we should seek to control the men who actually do the work, and we can do this—or attempt to do it—by getting a list of the men who get the sub-contracts. The general contractor should furnish a list of names of those he expects will do the work. And yet, the owner doesn't care so much as to who does the casual work—and he will not pay more if different sub-contractors are preferred. Third, an architect should name in advance to general contractors—to bidders—the sub-contractors he wants to do the work. But this remedy meets with objection at once. Bidders "kick" against it, and will not have it. Fourth, architects

should receive bids in advance, and then they could allow an allotted sum for each kind of work. This scheme, however, can hardly be put into practical execution. I know a Boston man who had an experience in erecting a bank edifice. He told the bidders they must put $300,000 in stone—and they objected to being dictated to. Fifth, the master builder should be put upon a quasi-professional basis. This is a better scheme than some I have suggested, because it enables the owner and the architect to select the right kind of a man. Under this plan the builder would do his work honestly and well, for, being a professional man, and one of probity, reputation, and standing, he would be sure to earn a fair competency and would be sure to do good work. This might be termed an "on honor" basis, and it seems to me to be the best solution of the matter. Builders employed on a "fixed charge" or commission basis are quite sure to do good work, and there is nothing antagonistic between owner and builder. Sixth, place the architect in the position of master builder—virtually the reverse of the fifth plan suggested to remedy the evils of the present general contracting system. For the architect to be master builder means that he will have the direct letting of the different parts of the work to workmen. This enables mechanics to feel that they are on a direct basis. Mechanics can bid against their own class. And yet I would be sorry to see this system introduced if architects of indiscriminate ability and knowledge were to be allowed to be master builders.

The plan to have architects master builders, to be successful, takes into account the fact that such architects should have a good system and organization back of them as well as ability, knowledge, and executive capacity. The danger may be, too, that if the architect became too much interested in the details of construction, he would lose sight of designing. It would, at any rate, be a bad system for general contractors, as we now have them, for, under it, they would not exist.

Another plan has been suggested—and virtually "indicated" by Chicago architects, viz.: When the drawings and plans are ready, let us have a quantitative surveyor to take off the plans; he can say to the owner: "Your building will cost you so much; shall I go ahead? If not we can make changes." The quantitative surveyor can say to mechanics: "Here is a contract that will bring you in so much. Do you want it?" Brassey, the English railway contractor, used this plan more or less—and it is a good one where honorable men are involved, and not so good where the contrary is the case and "skimping" may be done.

This striving to get away from "open bidding" is a result of a departure from old-time methods. The present system is unfortunate to the owner because he is not in touch with the actual builders, and this is because he deals with the general contractor. There are two main courses as to the future: The elimination of the broken contractor (who does no actual work), and the making of the architect into a master builder. The second course is one which will put the builder on a different plane from that he now occupies, viz.: A professional plane—a plane on a level with that of doctors, lawyers, and other professional men. The builder must be experienced, skillful and educated. He should not be left to chance in order to make a profit. Under the system of a fixed "charge" he would be sure to be remunerated. He would have the responsibility of the work on his shoulders—would aid and help architect and owner, and see that their wishes were carried out.

* * *

We would never learn the truth about certain folks if they didn't quarrel occasionally.

How Competitions Demoralize

ALMOST every architect enters for an occasional competition. It is the recognized method of filling up spare time and of keeping a staff together when there is nothing else to do. It is also the recognized way by which he who is engaged ordinarily in quite a commonplace practice keeps himself in touch with better things. Besides these two classes of competitors, and saying nothing of the young man who enters for the sake of the experience he may gain thereby, there yet remains a body of men who do nothing else but compete, trusting entirely to their successes—which may average, with the exceptional man, perhaps one in every twenty efforts—for their livelihood. Necessarily those who adopt this method of securing work, to the exclusion of all others, are clever architects, good planners, and excellent designers, possessing the knack of showing all the good points of their schemes with comparatively little effort, and often gifted with the power of adapting themselves to the known idiosyncrasies of the peculiar assessor. It is these men who really set the standard of competition work. They are well known to one another and to the assessors, as well as to the general rank and file of the profession, and it is not too much to say that any assessor of experience could pick out the work of this, that or the other of these architects, whatever precautions may be taken to prevent the disclosure of identity. They form a clique; but it is a clique of merit, entry into which is to be obtained by any capable man who has it in him to produce work of equal caliber with theirs. Almost all the open competitions in the country are carried off by one or other member of this small circle. Amongst them it is little more than a gamble as to who shall win—if that can properly be called a gamble which is in its very essence a game of skill. If the problem set is an easy one on a simple site,many men of less note are encouraged to enter, and may stand an equal chance; but large and difficult problems can only be dealt with properly, it seems, by those who have had experience in competition work on a large scale.

So far the state of affairs is well understood and is perfectly legitimate —except in this respect, that the public are led to imagine that architects must be excessively overpaid in the ordinary way if they are willing to spend an immense amount upon drawings, in competition with others, in order to obtain what, after all, is only the ordinary commission if they succeed in securing the work. At one time the conduct of competitions was a constant source of trouble, particularly in the days before the appointment of a professional assessor was a recognized necessity. With his advent one source of trouble has disappeared; but several others remain, the most prominent amongst these being a feeling, justified by many an award, that strict compliance with the conditions is not merely a non-essential, but is likely to be an absolute bar to success. There is one well-known competing firm which invariably puts aside the question of cost entirely and submits an ideal scheme. In several cases the result has justified their action. They have been able to show that a much better building could be produced if only the cost-limit were waived, and they have put their arguments so forcibly as to induce the assessor to recommend the adoption of their scheme. As a matter of strict honesty, this cannot be considered to be right; but the assessor's position has in every case been probably a difficult one: he has felt it his duty to advise the promoters that they would secure much better value for their money by spending a certain amount in excess than by adopting the plans of some other competitor who had literally complied with the conditions. The result has been good for the promoters and for architecture, but bad for the morality of architects.

There is always a temptation, when a cost-limit is fixed, to take the advice of some near relative of Ananias when compiling the approximate estimate, and this temptation becomes almost irresistible when it is known that time and again successful designs have in execution largely exceeded the stipulated cost. The matter is not greatly altered when a competitor honestly states that his building will cost more than the sum named, while pointing out the additional advantages secured by the extra expenditure, thereby securing an award in his favor, while, as a matter of fact, his design should have been disqualified. Most commonly, however, competitors will prepare elevations out of all proportion to the money which there is to spend, trusting thereby to win the competition, and having somewhere at the back of their brain a scheme for reducing the cost, in the event of success, by cutting away this feature or that—substituting, perhaps, eaves for a stone parapet, and brickwork for stone facing down side roads and flank walls, in order to bring down the estimate eventually, caring little that the building erected will then bear but a faint resemblance to that the design for which the promotors of the competition were so proud to approve on the advice of their skilled assessor.

Besides these, there are other well-known tricks—for they can be called nothing else—which are practiced by the less scrupulous competition architects. Perspectives are produced in which no notice is taken of intervening buildings, or they are "fudged," altering the proportions and improving the design, bringing out the more beautiful features, and hiding or omitting those which would be less satisfactory. Occasionally, careful examination will disclose the fact that plans do not agree with sections, nor sections with elevations. "The drawings have been prepared in a hurry, without thinking out all details." This is a very convenient excuse for one who has deliberately set aside the practical requirements of his plan when he has been designing his elevation; but as often as not it is untrue. The want of correspondence between drawing and drawing has been well known to the author; but he has allowed his desire to secure work to overmaster his regard for rectitude. As for conditions laying down precise scales for certain drawings, or stipulating that there shall be no shading and no washes upon the elevations, these are all made to be disregarded more or less, and it is even sometimes extremely difficult to say whether conditions of this sort have been contravened or not. When, for instance, a competitor outlines his prominent features with a broad ink-line, while using a fine line for the minor features, it can hardly be said that he has shaded his drawing, though the effect of shading is produced. When a color wash is prohibited, it is difficult to say whether a flat wash of light Indian ink is permissible. In a recent case it was stipulated that there should be no color washes except on the floors, and that the elevations should be in black ink only; a wash of diluted black ink was introduced—by one competitor only—over the roofs, in the windows, and to mark the recessing under a portico, two different shades being used. Was this honest or was it not? The matter must be left to the consciences of the competitor who thereby emphasized his design and the assessor who accepted it. On the same occasion another competitor spent some £30 in having wash perspectives made in light ink, and he was disqualified—most justly.

The net results of all of these considerations is that competitors are bound to see that strict honesty does not pay, while at the same time they are always in doubt as to how far they may go in their dishonesty with impunity. Nothing could be more demoralizing than this. By means of a strenuous effort the nomination of a professional assessor has been secured in almost every important competition; but the assessor selected is almost invariably

an old competitor himself, tainted by many years of contact with that which is scarcely right, and, without knowing it, he has lost an appreciation of the difference between what is strictly honest and what is not. Even when the most flagrant injustice has been done, the assessor has probably thought that he has acted rightly. We are not, of course, speaking of cases where the only fault to find has been lack of judgment, or of those others in which an assessor has apparently made a bad award in order to create trouble and eventually secure the work himself, but of the many in which the successful competitor has in some way or other travestied the conditions—to use the mildest word possible to explain our meaning. We have sought a cure from the flagrant dishonesty of the olden times, when wirepulling was the rule, and the local committee gave the work to him who had most friends; and the remedy is as bad as the disease, for the professional assessor even with the best intentions in the world is apt to be uneven-handed in his justice.

There is a general, but erroneous, idea that the best architects are necessarily the best assessors, and that the President of the Institute must, from his small acquaintance, be able to select the right man for adjudicating every competition. As a matter of fact, he distributes his patronage, during his term of office, as fairly as he can amongst the best-known competition-winners and the most prominent men on the Institute's Council, regardless of their fitness to act the part of judges in the ordinary legal and impartial sense. What is wanted now is to do away entirely with this patronage system of appointment, and to replace it by the life appointment of retired architects of known integrity, preferably acting on all large works as a jury of three, but occasionally working single-handed, always adopting one uniform system, and letting it be known that the slightest infringement of definite conditions will result in disqualifications. Conditions are often too strict; but here again the assessor is as much at fault as anyone else, for it is he who draws up the conditions, or, at any rate, approves of them. He ought to allow plenty of laxity where laxity is possible. At the same time, once having fixed limits in any respect, they should be most absolutely enforced. Competitors would soon come to know what they had to expect, and there would be very few attempts indeed to win by trickery of draughtsmanship, by misstatement of cost, or by improper finish of drawings if once it were understood that these things would inevitably meet their punishment. It is the fact that, while some assessors are strict, others are lax, and that few know whether strictness or laxity is to be expected in any particular case, which leads to the present deplorable state of affairs. The canker of dishonesty has entered into competition work, and needs to be dealt with as drastically as dry-rot in a building. —The Building News, London.

* * *

As It Seems

There was a young woman named Wemyss
Who complained of her terrible dremyss;
  When they called in the doctor
  Conceive how it shoctor,
When he said: "You have chocolate cremyss."
—Regina Standard.

* * *

Farmer Hayrick—Why are you going to charge the summer boarders more next year? Farmer Corntassel—I've called the place a bungalow.—Puck.

A Concrete Bungalow in Japanese Style

THE application of a Japanese roof to a concrete superstructure by Architects Brown Bros. of Cedar Repids, Iowa, has developed a striking novelty in bungalow architecture that is destined to become popular.

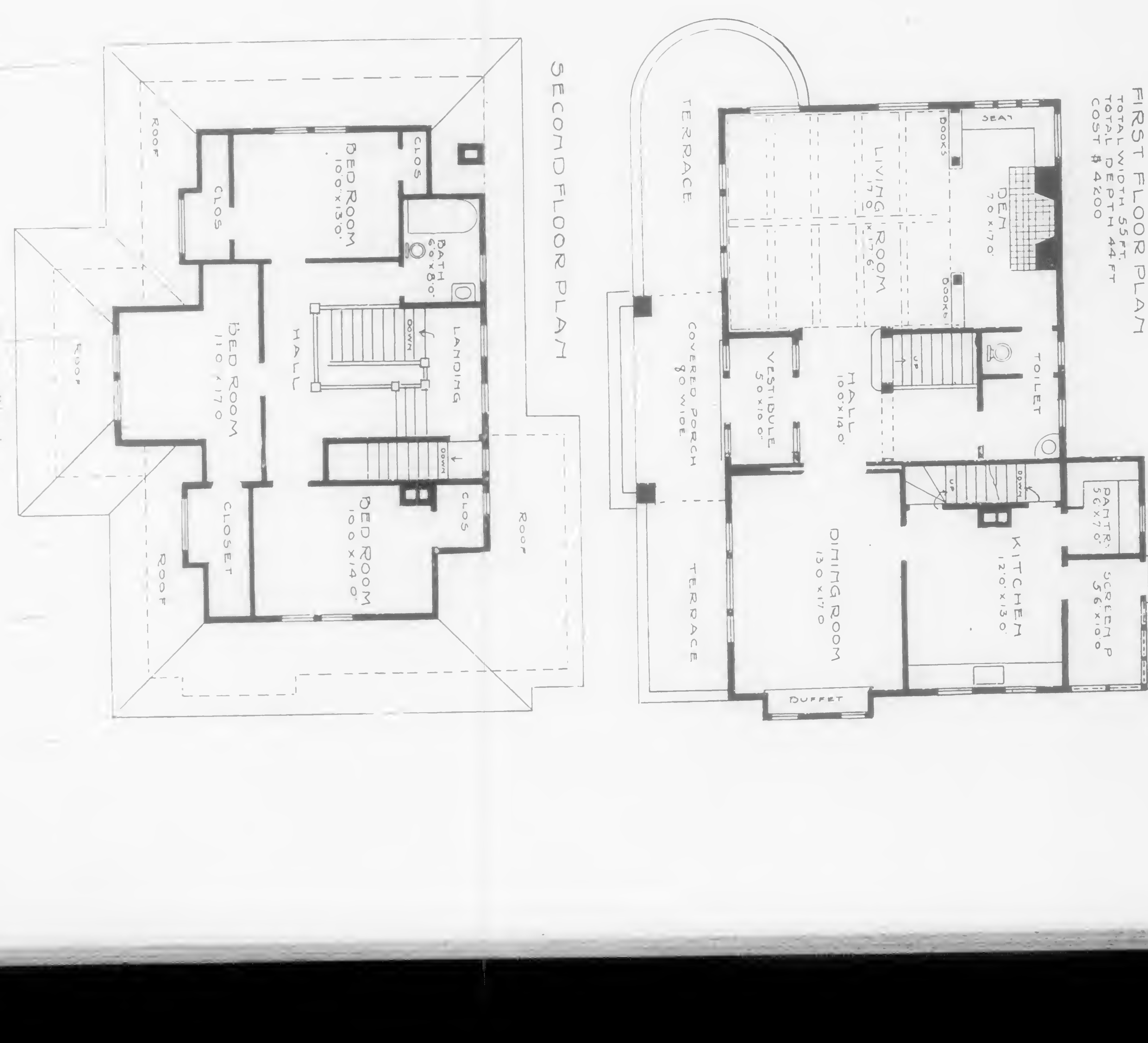
Living room, dining room, den, hall and kitchen are arranged conveniently on the first floor, while the seemingly small second story contains three roomy bedrooms and a spacious hall. The fireplace in the den and the beamed ceiling of the living room mark the bungalow style of interior treatment. The two rooms mentioned are in reality one great room, being separated only by the partition bookcases.

The covered porch, flanked by terraces and the tilted eaves, give character to the exterior. The house is designed for a lot at least 60 feet wide and is better adapted to a 75 foot lot. The design has been used in California, where the owner built the house for $4,200, using concrete block for the exterior walls, finished with stucco. The interior plaster was applied directly on the block walls. No basement was provided.

It is claimed by the architects that in the middle West this neat home could be built for $5,000 at the most carrying the walls down to the bottom of the basement, finishing the latter with concrete floors and installing a hot air furnace.



A Concrete Bungalow in Japanese Style — *Brown Bros., Architects*



A Concrete Bungalow
Brown Bros. Architects

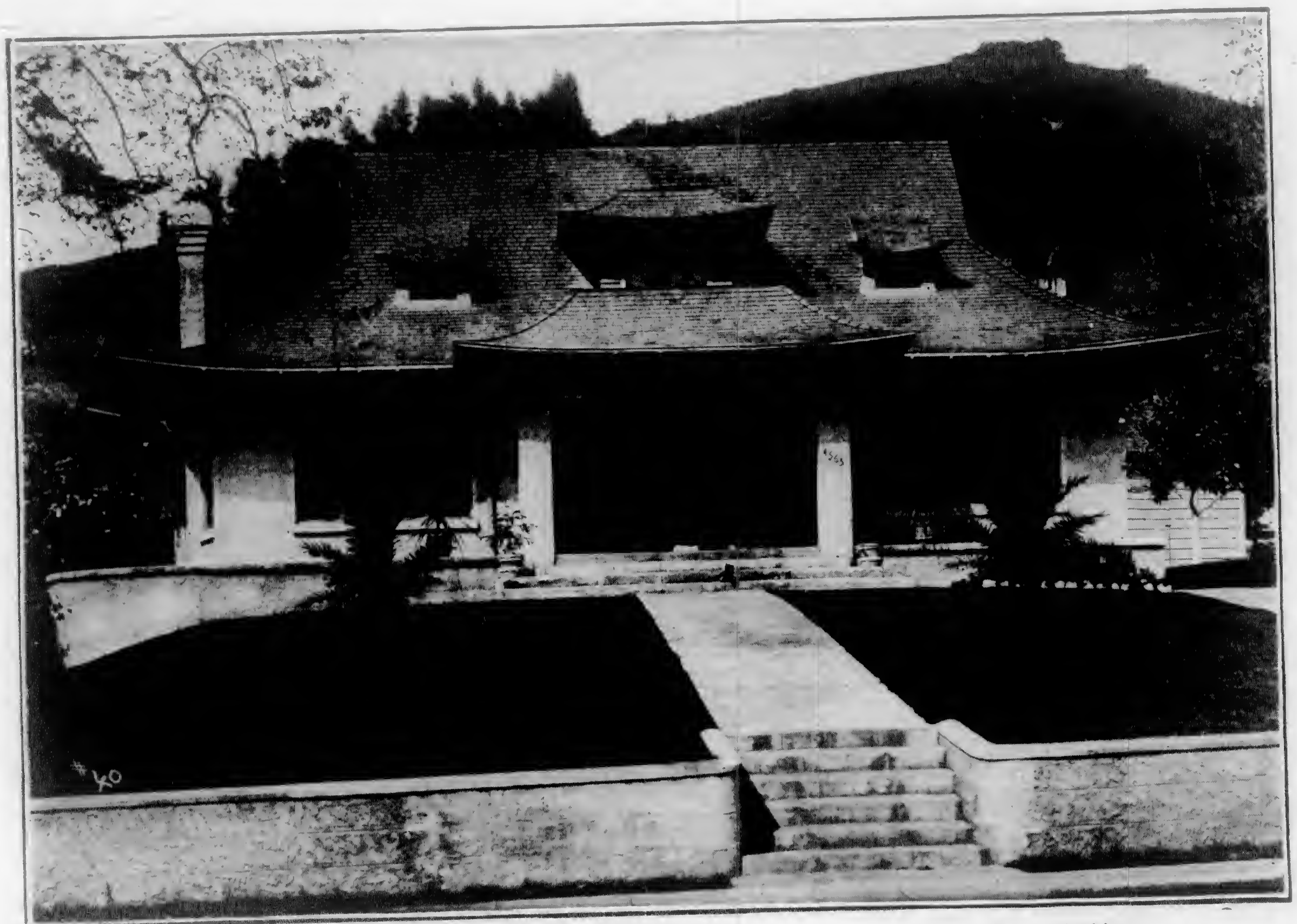
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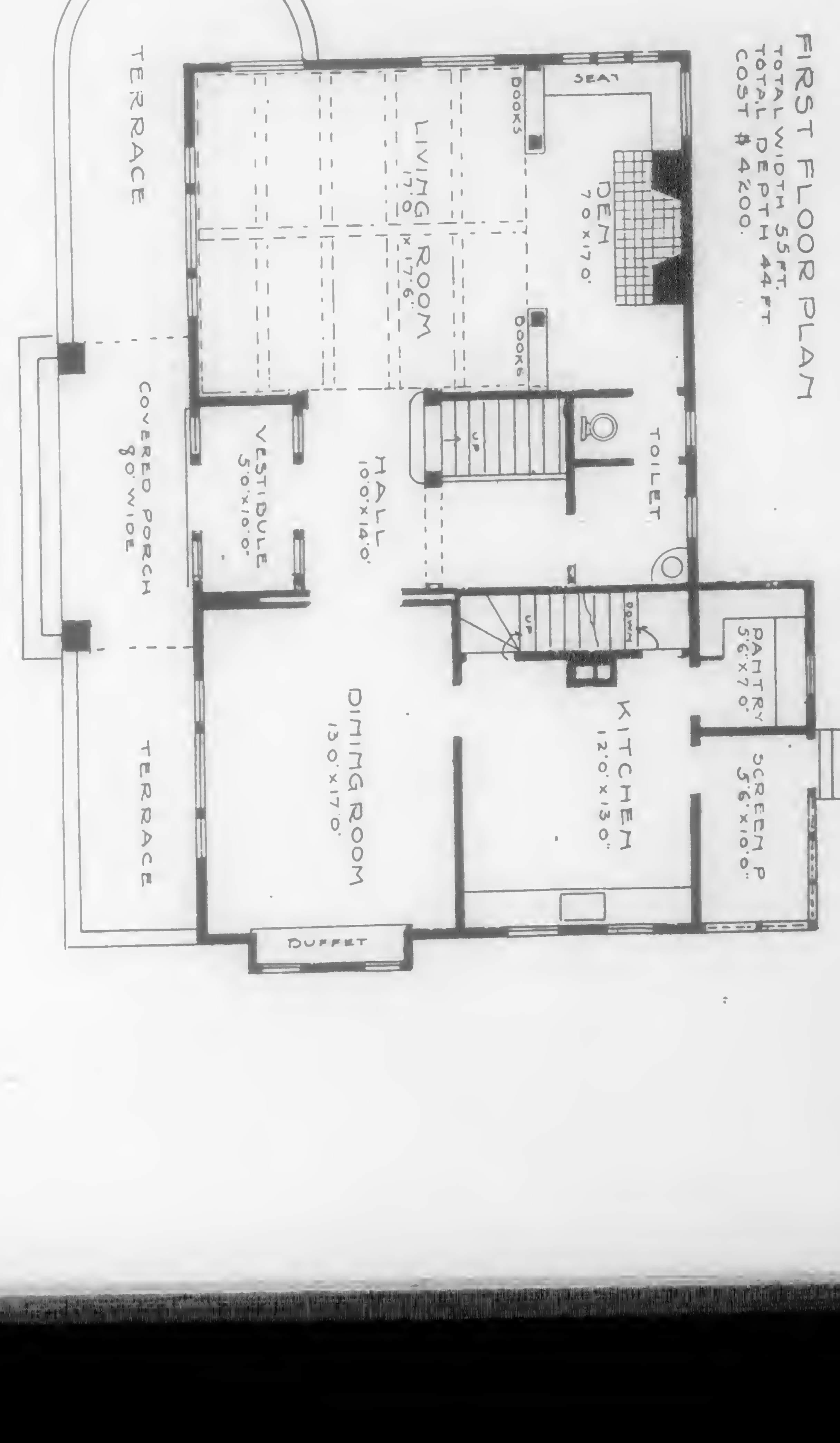
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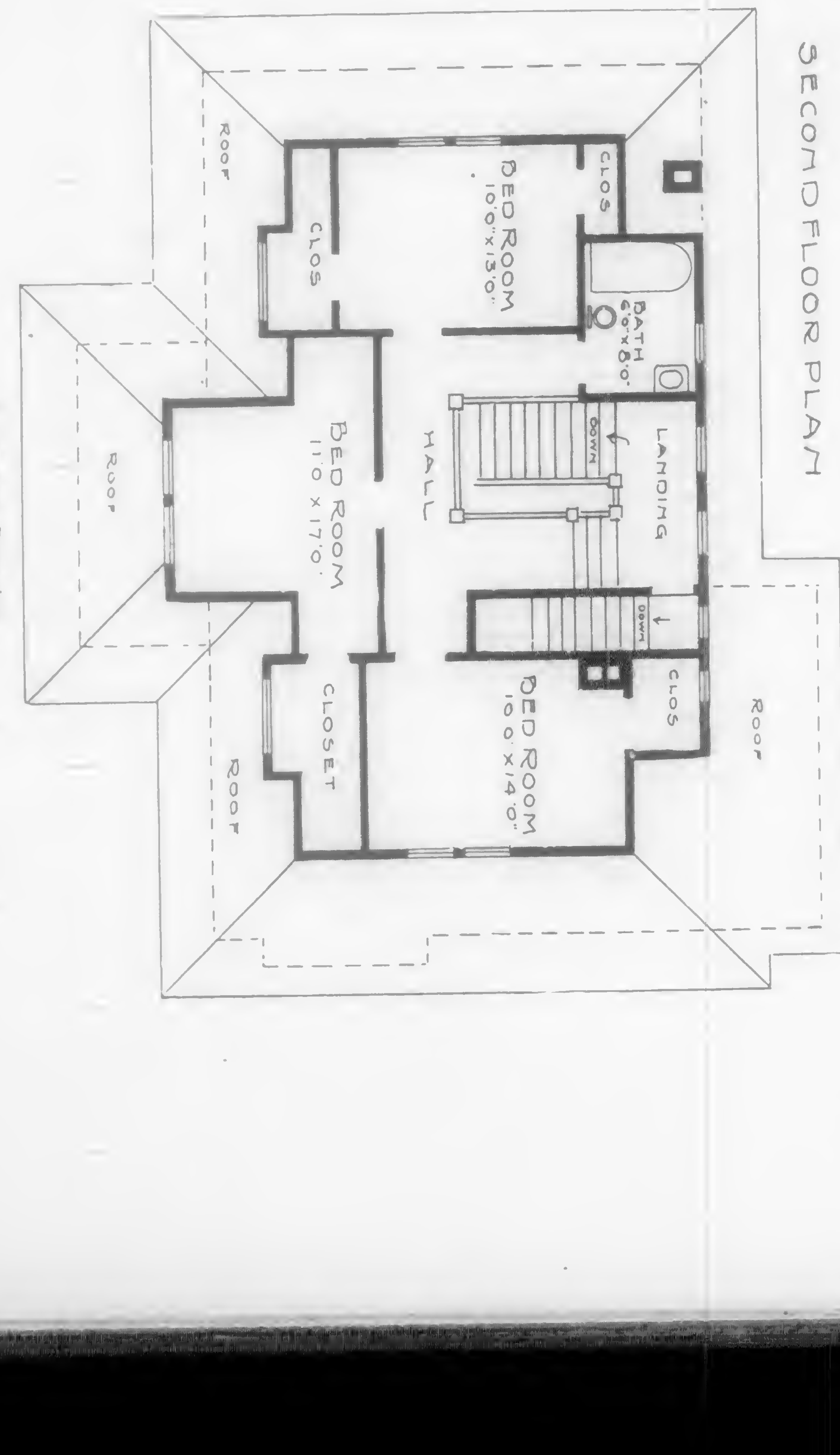
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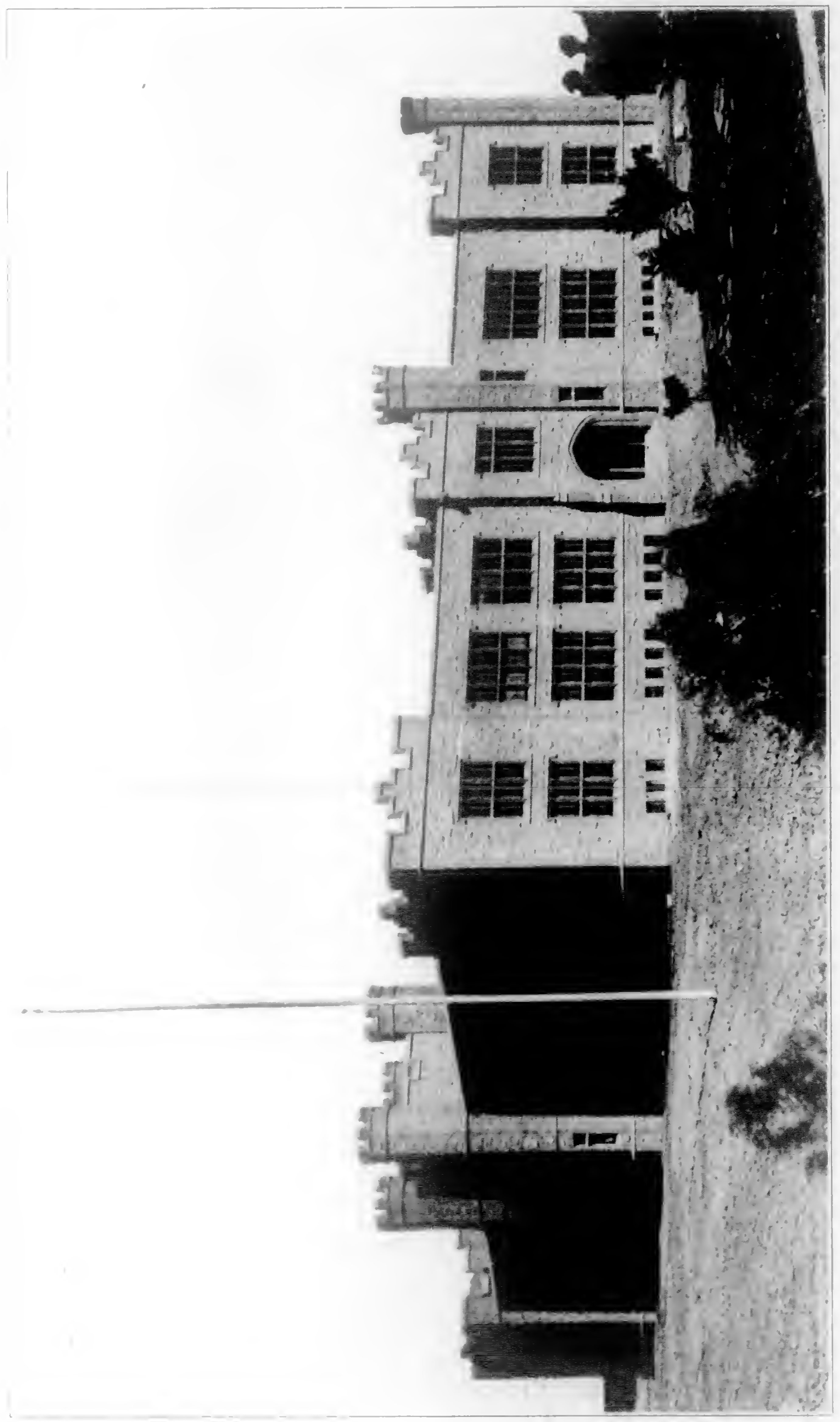


A Concrete Bungalow in Japanese Style — Brown Bros., Architects

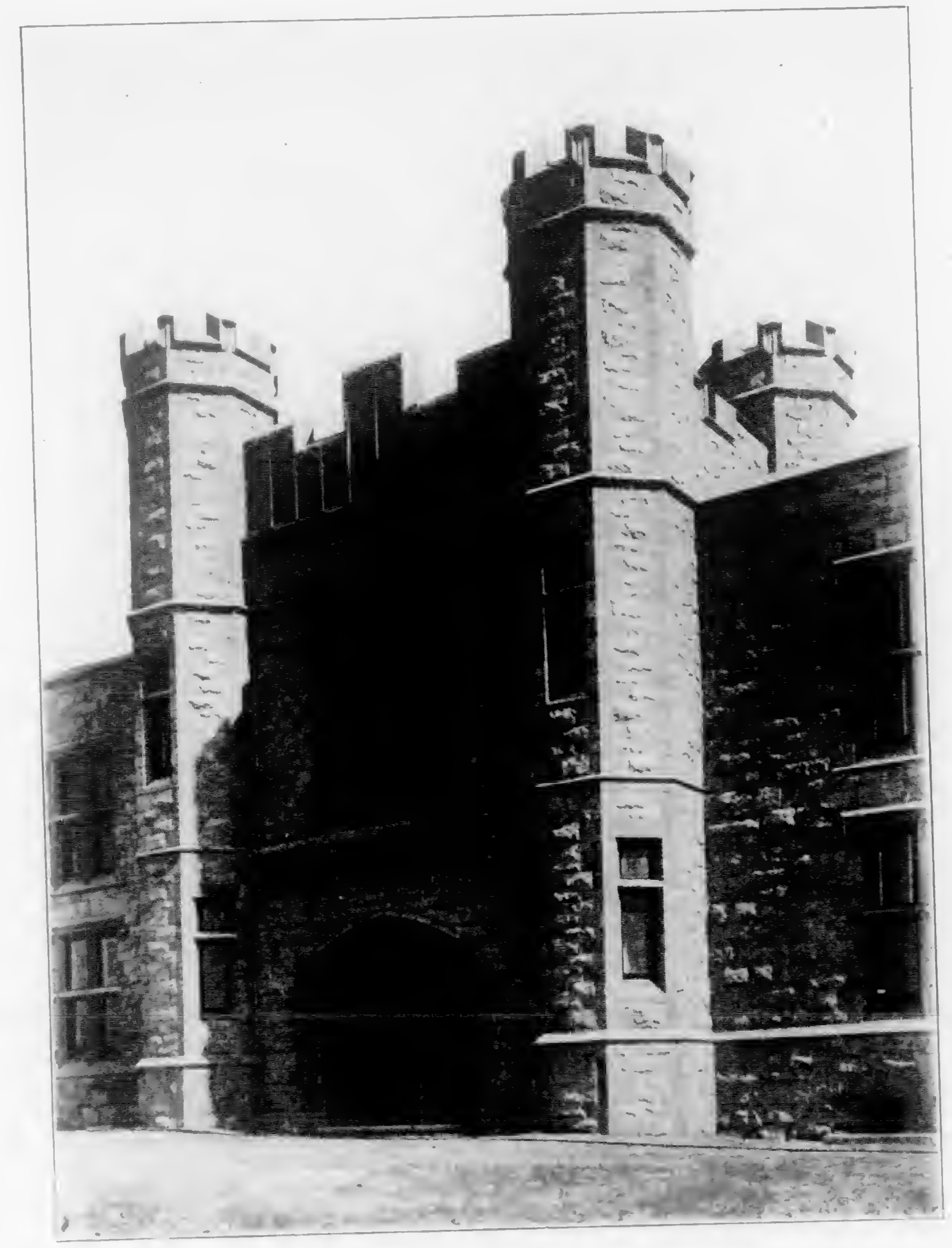




A Concrete Bungalow
Brown Bros. Architects



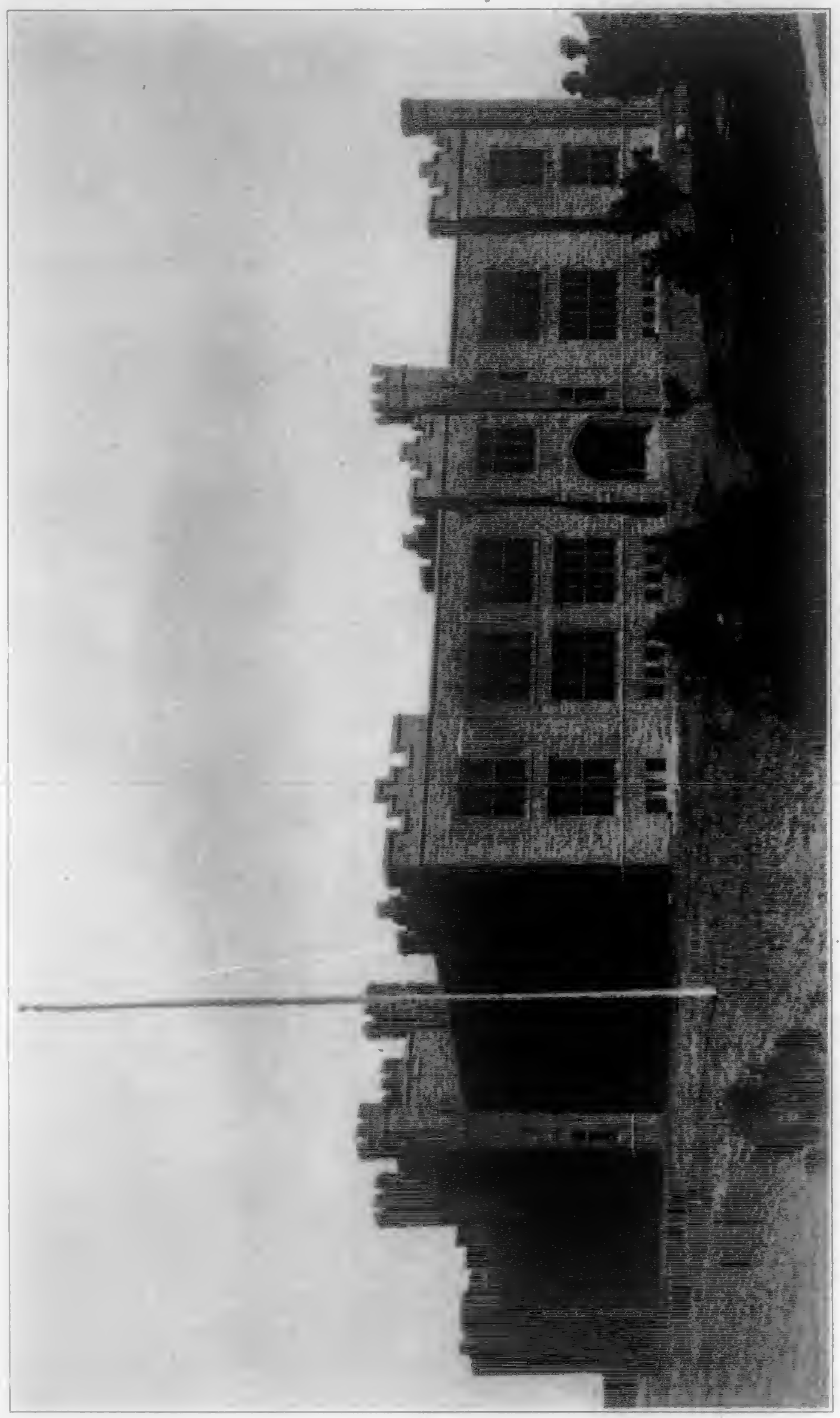
High School Building, San Diego, Cal. F. S. Allen, Architect



High School, San Diego, West Tower
F. S. Allen, Architect

Some Practical School House Designs by a Los Angeles Architect

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High School Building, San Diego, Cal. *F. S. Allen, Architect*



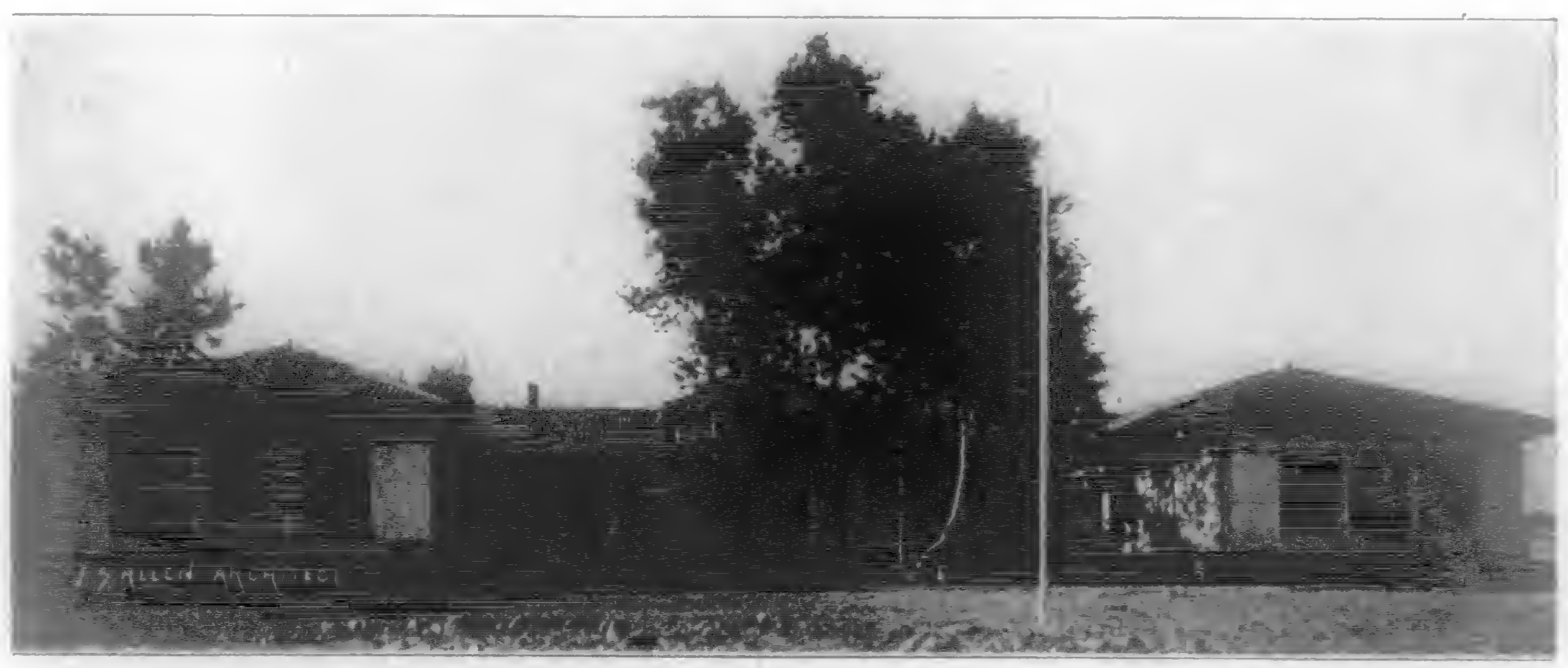
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High School, San Diego, South Tower
F. S. Allen, Architect



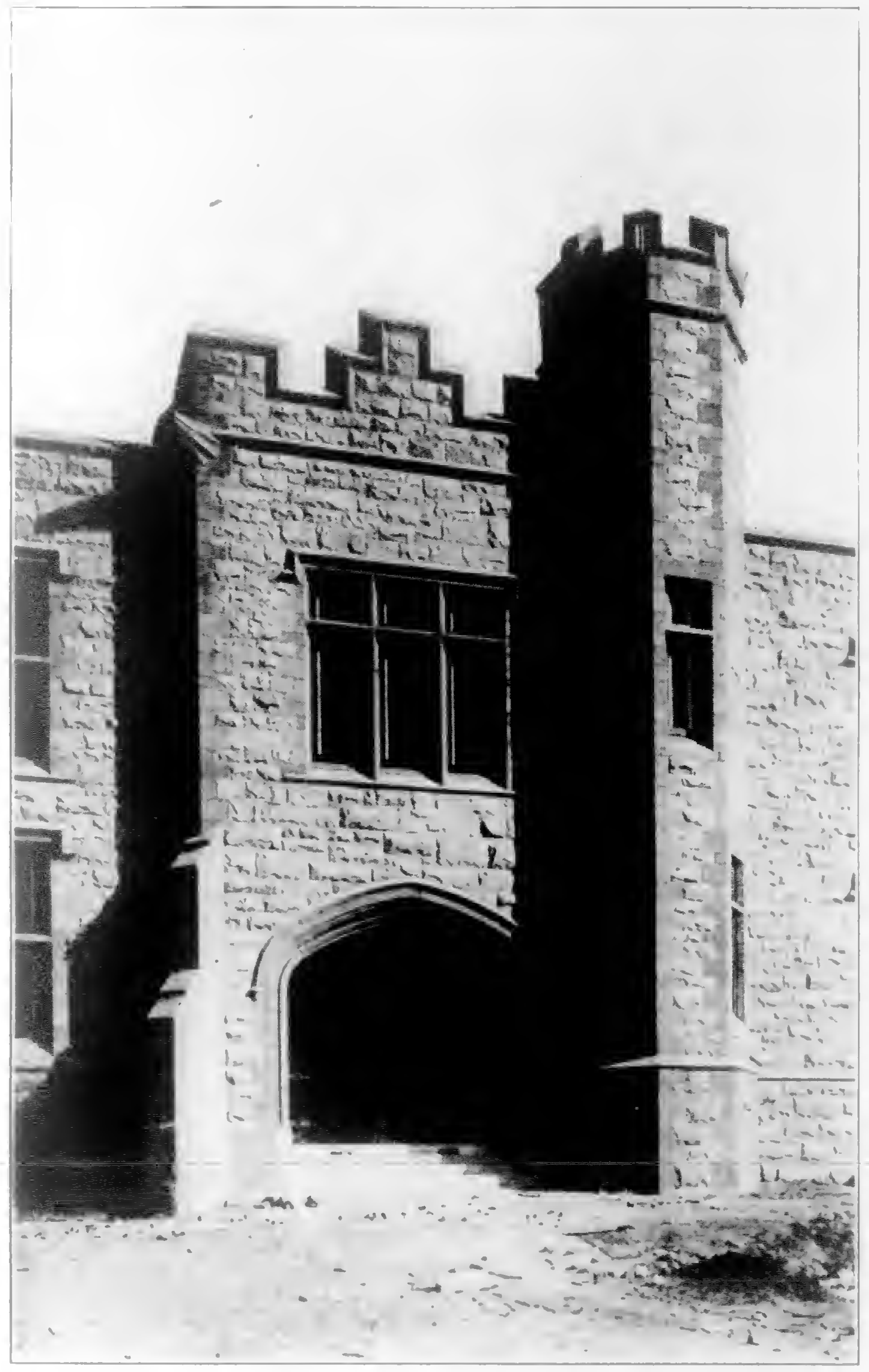
Claremont School, Claremont, Cal.
F. S. Allen, Architect



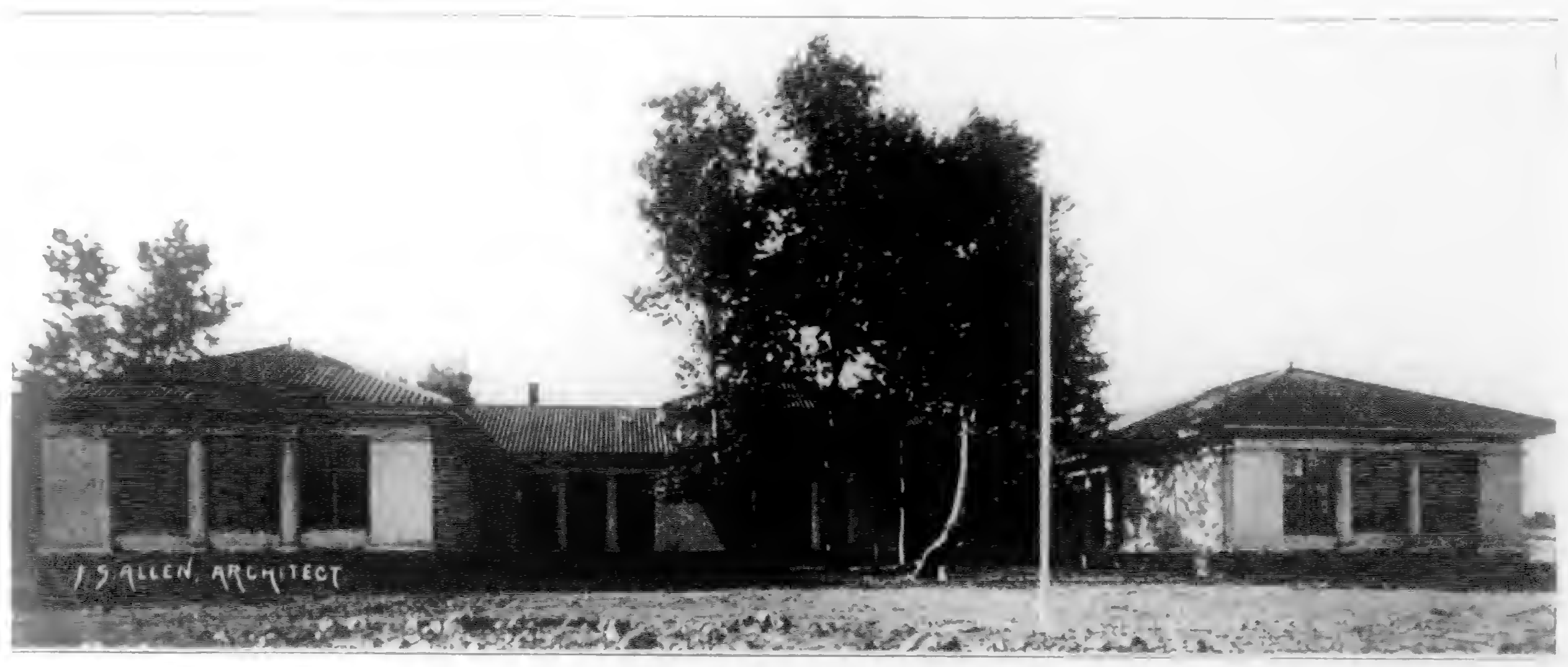
Claremont School, The Entrance



High School,
San Diego,
South Entrance
F. S. Allen, Architect



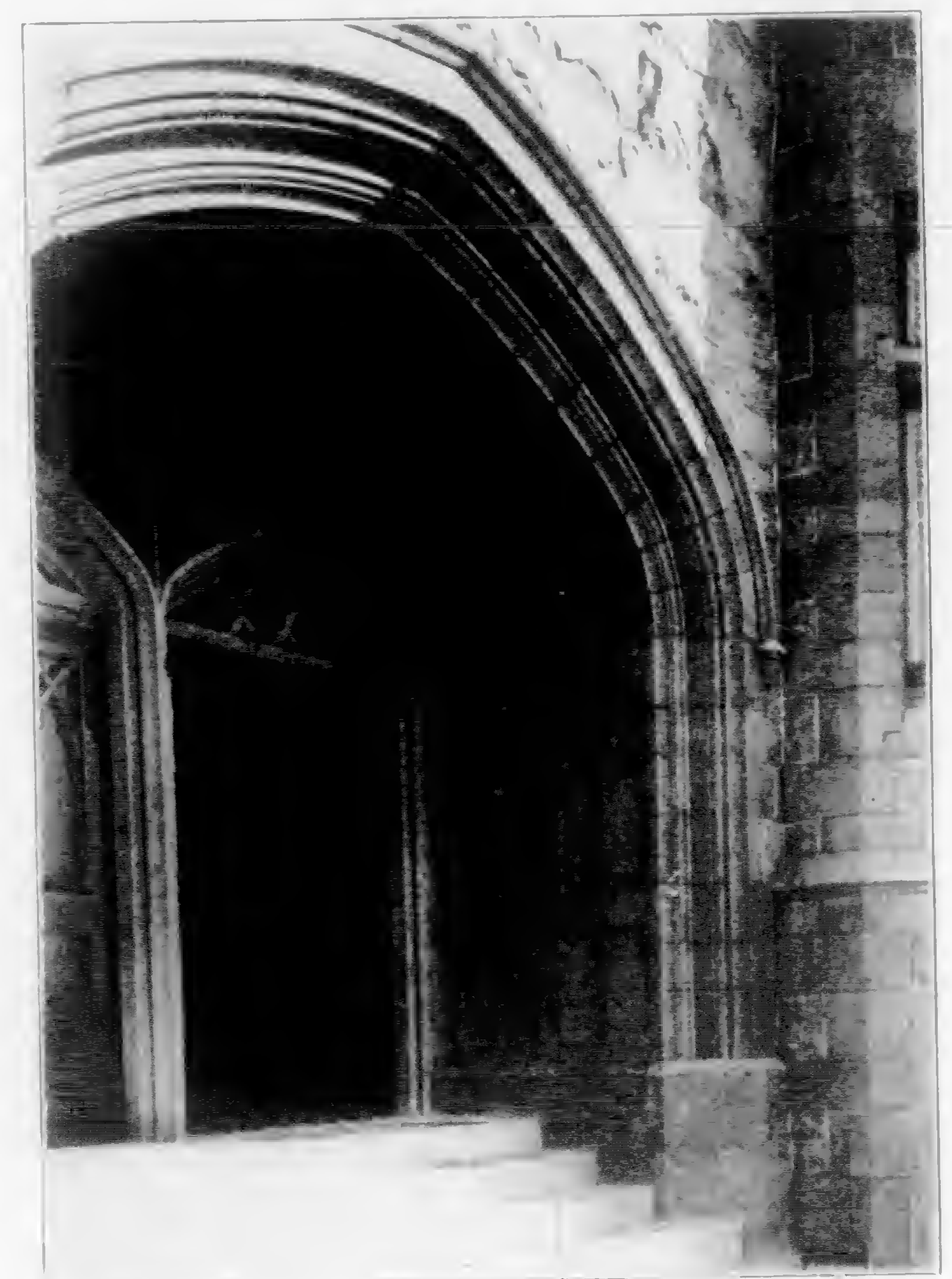
High School, San Diego, South Tower
F. S. Allen, Architect



Claremont School, Claremont, Cal.
F. S. Allen, Architect



Claremont School, The Entrance



High School,
San Diego,
South Entrance
F. S. Allen, Architect



Garfield School, Pasadena, Cal. F. S. Allen, Architect



Colonnade of School Building, Claremont



High School Building, San Pedro F. S. Allen, Architect



Garfield School, Pasadena, Cal. F. S. Allen, Architect



Colonnade of School Building, Claremont



High School Building, San Pedro F. S. Allen, Architect



American Music Hall, San Francisco
O'Brien & Werner, Architects

How Cold Storage Buildings are Made Heat Proof

THE modern theory of successfully insulating buildings for cold storage and other purposes is based upon entrapped air—air that is actually dead. This means that the air must be in sealed spaces and that the spaces must be minutely small—otherwise the essential idea of "still air" is overthrown. The insulation must depend for its entrapped air upon the interstices or cells of the material employed rather than upon alternate layers of solid insulation and air spaces.

This new principle of insulation, which does away with double walls with air spaces between, has brought into vogue solid insulation, says a writer in the Cement Age. In this type the protection consists of layers or blocks of various materials set in Portland pitch cement directly against brick or concrete walls and protected on the inside surface by plaster or tile. The space occupied by solid insulation is much less than that utilized by the older construction. If a fireproof or slow-burning material be used in making the insulation, the fire risk is greatly reduced.

The materials available for this so-called "solid" method of insulation are chiefly cork and compressed mineral wood blocks.

Cork, by virtue of its natural state and apparent use for which nature intended it, lends itself admirably to insulating purposes. In cold storage work, cork is efficient as a nonconductor of heat, is free from capillary attraction and has no tendency to absorb moisture freely. When used as cork boards it is granulated, compressed in iron molds and baked while under pressure, its own natural gum being liquified by the heat and uniting the granules into solid blocks. These have structural strength and are quite fireproof.



New Type of Bridge in Which the Concrete Floor Is Suspended From the Arch

Concrete Floor Suspended from Steel Arch Forms Unique Bridge

A BRIDGE constructed on a unique plan is approaching completion over the Pennsylvania railroad's line in Philadelphia. The bridge, which was designed by George S. Webster, Chief of the Railroad's Bureau of Surveys, differs from other bridges in that its concrete floor is suspended from the arch. Another oddity is the arch, which is a steel box girder and will be filled with concrete.

"This," said Mr. Webster by way of explanation, "gives the arch greater carrying capacity and requires less metal, thus protecting the steel from corrosion. Economy also entered into the construction of the bridge. By the plan in vogue the cost of construction did not exceed $76,000. Otherwise the cost would have been $110,000."

The only other bridge of this type is at Bellow's Falls, Vermont, across the Connecticut river. The bridge in course of construction has a span 262 feet in length, composed of two steel arches, giving a rise of 40 feet from the roadway. The floor is 20 feet above the tracks, making the top of the arch 60 feet above the tracks.

* * *

Keeping Cupid on the Job

"That widow is a good manager, isn't she?"

"Manager? I should say so. She got that house of hers practically fixed up like new for nothing."

"How did she manage it?"

"She was engaged to the carpenter till all the woodwork was finished, and then she broke it off and married the plumber."—Baltimore American.

Concrete Water Tank on the Ranch

By HELGE PETERSON.

IT frequently occurs that the smaller concrete contractor is called upon by the up-to-date farmer to do work in the country, such as foundations, floors, tanks, cisterns, milkhouses and similar structures. In most cases of this kind the farmer furnishes the material. This leaves no excuse for doing poor work in the attempt to save material—which unfortunately occurs in some cases, thus hurting the reputation of cement work in general—so concrete work on the ranch should always be first-class. It is the plan of this article to give some personal notes on concrete work on the farm which represent several years' experience in this special class of work.

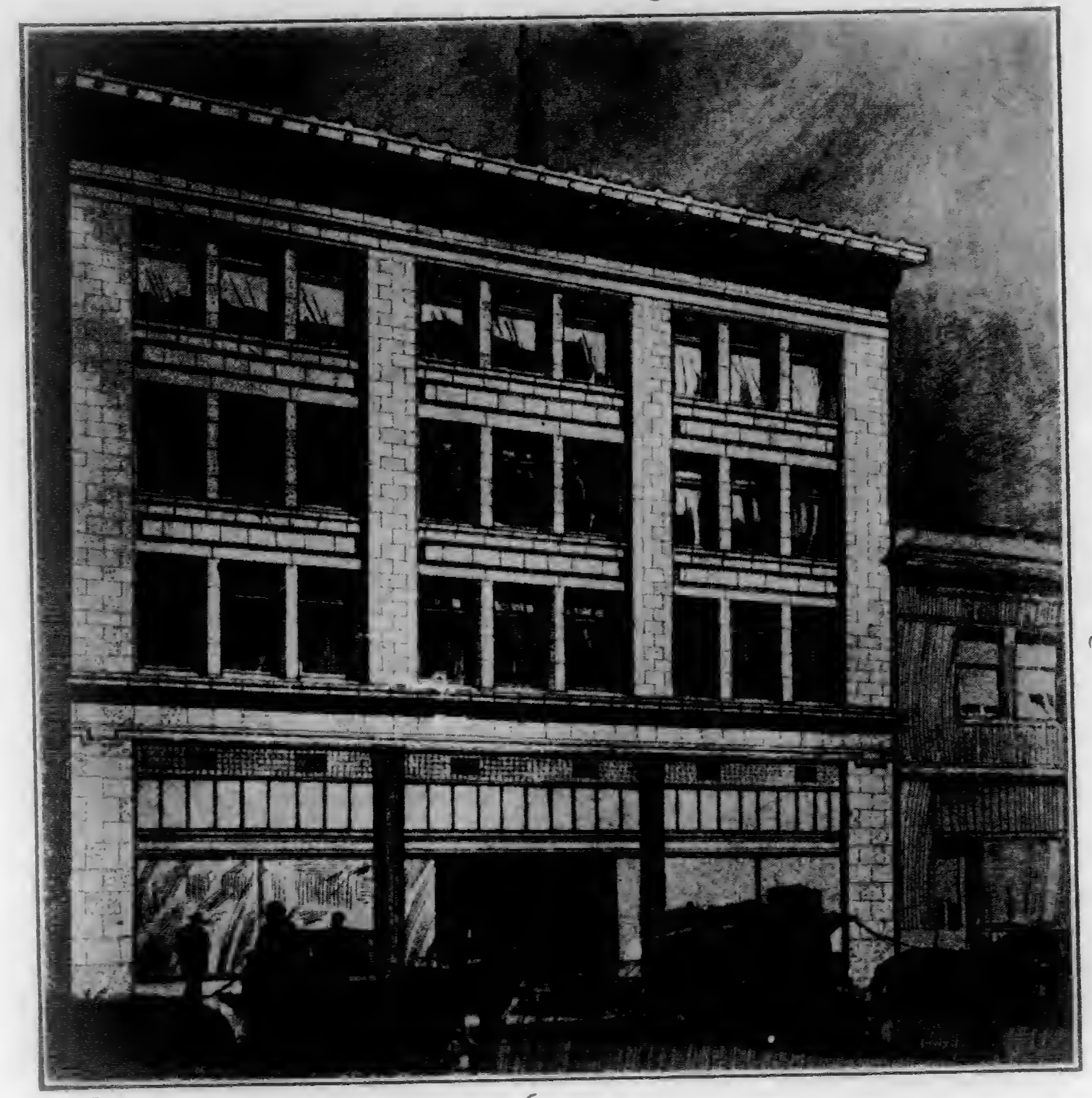
Concrete water tanks are becoming very popular on the ranch, and when properly constructed will give long service and complete satisfaction. About two years ago, while I was doing some sidewalk work in a small town, farmers came to me nearly every day consulting me in regard to cement tanks and how to "fix" them. A few so-called "masons" had been building a number of cement tanks around the country, and nearly every one was cracked and leaking. Some were built almost on top of the ground, without foundation of any kind, while others had the sides built separate from the bottom. All were useless. The farmers said they understood that cement got just like stone, and that no heaving, expansion or contraction would ever crack it. I may add that I did not "fix" many of these tanks—I never learned that trick.

To construct a stock tank which will remain solid and give satisfaction, I have found the following method most successful: For a foundation, excavate to a depth of about three feet, making the hole about two feet longer and wider than the tank is to be. Put in drains—either tile or stone will do—to prevent the surface water from accumulating under the tank. If stones are used, they should be broken, and not used larger than four inches, and there should be at least one foot of gravel under them. Next fill the pit with gravel or cinders within eight inches of the top, level it off for the tank bottom and tamp firmly, using plenty of water to settle it.

The standard depth of a stock tank is twenty-four inches. Add eight inches to this for the bottom concrete and make the outside form thirty-two inches high. When this form is solidly braced in place, spread a layer of concrete eight inches thick over the bottom, reinforcing with iron of any kind, old wagon tires, iron rods or heavy wire.

The inside forms should be made twelve inches shorter than the outside forms at the top and eighteen inches shorter at the bottom. This will give a bevelled wall six inches thick at the top and nine inches thick at the bottom. When the forms are built, put in the outlet pipe for cleaning and then place the concrete, tamping it with a bar or spade. Reinforce the corners with wire or rods. Where it is desired to put on a flat cover, set one-half inch bolts, eight inches long, in the concrete to a depth of five and one-half inches, and fasten to these a two-inch by six-inch plank, to which the cover can be nailed.

In hot weather remove the inside forms about three hours after the walls are made, and apply a coat of cement plaster over the sides and bottom. Then apply a wash of cement and water with a paint brush to finish the tank inside. It is better to leave the outside forms in place until the tank is filled with water. A wash coat of cement and water over the outside will make the tank damp-proof and frost-proof and will also give it a more finished appearance. It is advisable in warm weather to fill the tank the day after it is built.



Building for Archbishop Riordan, Mission Street, San Francisco
Steel Work by the Brode Iron Works — *Smith O'Brien, Architect*

Some Concrete Dont's

Don't use large stone or gravel for reinforced concrete work. For floors everything should pass through a ¾-in. mesh.

Don't sift the fine particles out of your sand.

Don't give the selection of the aggregate less attention than the selection of the cement.

Don't leave unfinished concrete work in cold weather without covering it with sacks or felt.

Don't omit to provide for change of volume (expansion or contraction) when dealing with large horizontal or vertical areas.

* * *

Common Sense

This question was asked upon an examination paper: "What steps would you take in determining the height of a building, using an aneroid barometer?"

The answer was: "I would lower the barometer by a string and measure the string."

Search for Most Resistant Pile Timber is Made in California

"WHAT wood is most resistant to the attacks of marine borers?" This is a question uppermost in the minds of all owners of harbor property. Timber experts in some parts of the country give more attention to the solution of the question than others in many cases, and just now it seems that the keenest search for the most resistant pile-timber is going on in California.

The claim is made that eucalyptus piling is more resistant to the attack of marine borers than any other pile timber found on the Pacific Coast, also that certain eucalypti are more resistant than others. It is also claimed that Lawson cypress is particularly resistant to attack. Furthermore, some prominent engineers assert that many creosote treatments now practiced are not effective against borers and that various pile casings are of doubtful value. It is true that a great many piles, both treated and untreated and consisting of different species, have been driven, but in most cases records of durability have not been kept and in no cases have the different species and methods been directly compared under exactly the same conditions, thus making the results of little value.

With a view to furnishing this authoritative information, the Forest Service has planned a series of experiments to be carried out at San Francisco and San Diego. It is the intention to secure several piles each of all of the species of timber occurring on the Pacific Coast which might be used for pile purposes. This will include different species of eucalyptus, Douglas fir, western yellow pine, western red cedar, redwood and Lawson cypress (Port Orford cedar). In addition, it is the intention to secure Douglas fir piles treated with various preservatives and protective coverings. In the experiments only 8-foot sections having an average diameter of 10 or 12 inches will be employed, inasmuch as the cost of handling and transporting larger piles would be prohibitive.

One-half of each kind of timber will be installed at San Francisco and the other half at San Diego. The sections will be fastened to concrete caissons if available. If not, the sections will be fastened to creosoted piles. In such a case they will be so fastened that a space of a few inches will occur between the creosoted pile and the experimental timber. This will guard against any influence which the proximity of the creosoted pile might have on durability. They will be so placed that the upper end will stand about a foot or two above low water-mark.

The ends will be properly protected with asphaltum, copper, or some other suitable substance to guard against the longitudinal attack of borers. Each section will be properly marked with a copper tag for identification. In addition a detailed map will be drawn showing the location of the sections after they are placed in position. In no case will less than six sections of one species be included. The experimental material will be inspected at frequent intervals and reports will be prepared covering the details of the experiments.

Some difficulty is being experienced in securing a sufficient amount of timber for the tests, especially the different species of eucalyptus. Any owners of eucalyptus timber who are willing to furnish a small amount for this purpose should communicate with the Forest Service, San Francisco. Already several manufacturers of pile casings have signified their desire to have piles treated by their various methods. It is hoped that all such treatments will be well represented.

Timber Decay Costs Millions

MILLIONS of feet of timber and finished lumber rot every year in railroad ties, bridges, trestles, piles, farm buildings, fences, poles and mine props. The lumber-consuming public of the United States pays perhaps thirty to forty million dollars a year to make good the losses from wood decay.

These great drains are a source of more and more concern each year. Chemists and engineers who have to do with the uses of wood are working unceasingly on the problem. The U. S. Forest Service has men who devote their whole time to it. The importance of the problem cannot be over-estimated. Millions of dollars are annually saved by preservative treatment of timbers, but much yet remains to be learned.

Wood decay is caused by fungus, a vegetable growth sometimes so small that it can be seen only with the microscope. Its roots or branches, like minute hairs, force their way into the wood tissues and absorb or eat away the solid parts. The collapse which results is called decay. Timber is artificially preserved by forcing into its cells and pores certain substances which prevent the growth of fungi. As long as this substance is present in sufficient quantity, the germs of decay—the threads and spores of fungus—can not enter, and the wood is preserved. This often means doubling and sometimes trebling the life of the timber.

The United States government considers the investigations of the preservative treatment of timber of such importance that the business of one office of the United States Forest Service, that of Wood Preservation, with new headquarters at Madison, Wis., is given over entirely to the work of experiments in co-operation with railroad companies and other corporations and individuals in prolonging the life of railroad ties, mine props, bridge timbers, fence posts and transmission poles.

The lengthening of the life of timber means the saving of thousands of dollars annually through doing away with the heavy expense of labor and cost of material for renewals.

* * *

Concrete for Bridges

THE following item from the Spokane Spokesman urging the use of concrete in the construction of viaducts in that city will be found of interest:

"Concrete is by all odds the best material for bridges. It is taking the place of steel everywhere. The objection to its extra cost does not stand except in instances where very large arches are required. In the viaducts there will be no long spans, and if solid concrete construction should cost anything at all above the price of a combination of steel and concrete, the additional expense would be small. It would be well worth bearing in order to get solid concrete structures. Concrete is permanent. Its strength increases with age. Steel requires frequent repairs, and where it is in the vicinity of railroads it is subject to injury by the smoke from the locomotives. Concrete means that the money that the viaducts cost will be spent at home. Home labor will be employed. But steel means sending the money east and paying heavy charges to the railroads for transporting the materials. Not least important is the matter of appearance. Spokane must compete with other cities in attractiveness. The thousands of families that are looking for homes in the West are apt to select the place that shows evidence of civic pride in the beauty and substantial character of its public works. There is no dispute

about the superior beauty of concrete in bridges. Spokane is going to have a fine equipment of concrete bridges, with the remarkable one at Munroe Street to attract the attention of every visitor to the city. It would be too bad to break the rule in the case of the viaducts, which will be extremely conspicuous structures."

* * *

Here are a few boiled-down facts about concrete bridges, taken from an exchange:

Cost slightly more than steel bridges.

Difference in price soon made up in repairs.

Money spent for steel bridges goes to Eastern manufacturers and railroads.

Money spent for concrete bridges is mostly spent at home. Labor is principal cost.

In many instances a great part of the material used in concrete bridge construction can be found at the bridge site.

Concrete bridges are permanent and eliminate annual repairs.

The life of a steel bridge depends upon the constant care given it to keep it in order.

No painting or other occasional expensive adjustment on concrete bridges.

A concrete bridge grows stronger with age. Other types deteriorate.

Loading capacity of a concrete bridge is four to ten times greater than the ordinary steel bridge.

No wooden floors to keep in repair.

* * *

Largest Scrap Heaps in the World

THE largest scrap heaps the world has ever known, relics of the great conflagration of April, 1906, are located in San Francisco. One heap is forty feet high, 100 feet square, and contains 20,000 tons, all cut in equal lengths of eighteen inches, and piled in one solid mass, with the sides as smooth and as solid as a brick wall. This is the only one of four, of equal size and proportions, remaining intact, in its original size and shape, the other three having been drawn upon as the material was needed. Many other scrap heaps are piled about the bay awaiting shipment, some as big as a house and others mere hillocks, scattered over acres of ground.

Since the fire, one company has handled 150,000 tons, which constitutes the major part of all old material shipped or melted. It has six large shears in operation to cut the iron and steel, either that it may be better handled for shipment or for the furnace. Besides the four heaps which are piled in ship-shape trim, there are other piles of uncut scrap, forming heaps, rearing their tops way above the high fence surrounding the scrap yard. Little of this scrap is used in San Francisco, the bulk of it being shipped to the Atlantic coast or to European ports, to be returned to San Francisco, in part at least, as a manufactured article.

The history of the scrap heaps dates back to the great fire of April, 1906, when the huge iron girders and beams were twisted and bent out of shape, and almost melted. While still almost too hot to be approached, some enterprising men and boys commenced to "pick up" scrap in the burned district, every lot of which was littered with scrap iron and pipe, boilers, tubes and all sorts of metal used in buildings. There was so much scrap in the miles of empty lots from which the buildings had disappeared that no one cared or claimed the stuff, and the ordinance against looting was not rigidly enforced by the police. The gatherers of scrap had all sorts of excuses for taking the stuff which, at that time, appeared worthless, except for holding a rag roof over a temporary apology for a tent, and in some cases, owners paid for having their lots cleared.

Later men familiar with the junk business hired wagons and boys and gathered scrap iron and steel where they found it, in some cases paying a trifle for it; in others, they obtained permission to take it away. Not a few of these men found ready buyers and made fortunes within a few months.

* * *

Rooms in the Ideal House

IN writing on the "Ideal House," Percy Russell, an English authority on decorative subjects, says:

"The dining room of the Ideal House should certainly be light, cheerful and full of color tones well designed and properly worked out. Monotony, above all things, must be sedulously avoided, and the whole should be so arranged that after being in the room many times there should still be plenty of detail to engage the attention and please the eye. The decorator should here be a veritable poet in colors and lines, and his aim should be to produce a general effect, that once taken in, encourages the observer to look into details and to find in each some new touch of beauty. Let the walls be warm, with well-contrasted bright colors, remembering that there is no better digestive than cheerfulness and a general sense of reposeful pleasure. Cornices, columns and brackets of finely carved work should relieve the walls, and mosaics of colored precious woods might be ingeniously worked in all around, somewhat after the style of the Flemish Renaissance, where the walls are panelled and worked in with suggestions of fish, flesh and fowl, or the vine introduced, with delicate references to the origin of wine and the like. The ceiling should be deeply groined and richly ornamented, and the actual furniture can be of fine walnut, richly and appropriately carved."

For the drawing room Mr. Russell advises a room that is a place of light and beauty. "But nowhere," says he, "should there be anything like a glare, and the arrangement of walls, ceiling and floor must be such as to thoroughly blend together in complete harmony. There should be plenty of small and convenient tables. Satinwood is a good groundwork to be inlaid with original designs worked out in various woods. The chairs should be various, some of them Louis XV style, others after the Empire, and again intermixed might be examples from the Orient, with all kinds of odd stools. The walls may be in satins, and one style that is effective is a ceiling billowed over in a similar material. Another variant is to stretch a rich brocade on frames. As to the prevailing color note, gray-blue may be recommended.

"As there would be more than one drawing room in the 'ideal house,' the dwellers therein could have the luxury of a variation. One might be carried out in white and yellow with a green touch in the curtains and hangings. The white wood writing-table, for example, could be relieved by green. The carpet should in this case have geometric designs in, say, green and yellow, the ground being a warm cream. On the walls we could have a brocade in bright gold, strewn with a cameo-like geometric decoration. The moulding of the ceiling should correspond with the yellow tone of the walls, while the windows should be draped with silk of the same hue, a color that we believe the Chinese, who know something about cheerful decoration, have called 'the daughter of light.' The warmth of these hues undoubtedly induces placidity, cheerfulness and general complacency, and that should be the object aimed at by the decorator in equipping drawing rooms, where it may be supposed that the spirit of enjoyment reigns supreme."

Vitrified Brick Roadways

By WILL P. BLAIR in Good Roads Magazine.

A VITRIFIED brick highway is the one kind of pavement for country roads that has clearly passed the experimental stage. The most important special features that have been proven beyond all dispute are as follows:

They are the most economical.

They are the most satisfactory in use.

Their proper construction in all its details is easily understood.

It is true that they may and generally do cost one-fourth to one-third more in the first instance than any of the highways made of macadam and broken stone, even where they are treated by one of the various methods in the use of asphaltum, oil or tar.

The cost of a highway, however, is not to be measured by the first expenditure for it, but it must be measured by the cost of the first expenditure plus the cost required to maintain it in first-class condition for the purpose for which it was built.

There is another element of cost that must be considered by way of comparison in the economy of a brick road with that of any form of gravel or macadam, and that is, the deteriorated condition which always obtains for a considerable lapse of time before a repair is or can be made.

The writer witnessed a condition illustrating this element of cost but a few days since. Six years ago, to the then corporate limits of the city of Linton, Ind., a brick street was constructed. Three years afterwards it was determined to construct a highway of broken stone from the terminal of this improvement some distance into the country. From the time the improvement was finished, the highway was subject to excessive travel. For more than a year past, a deteriorated condition of the stone portion of this road was such as to make it impossible to haul as much tonnage per vehicle by at least 50 per cent. as was hauled over the road when in first-class repair.

The economy of that road must be measured by the loss incidental to its condition and character. In this case, as in all like cases, the brick portion of the road sustains every element and character of a high-class road, as from the beginning. It carries the same load and will carry the same load for years to come.

The broken stone road entails a 50 per cent. loss in its use. Unless rebuilt and brought into complete and full repair, it will soon lose its value entirely as an improved road. The difference in the cost of the two is consumed already. The writer recalls another example of a macadam road constructed three years ago in northern Ohio, at a cost of $76,000. It has proven so worthless in use that the farmers along its route, tired of the excuse for a road, have recently petitioned for a brick road, thus correcting the mistake they made in the first instance, willing to throw away the $76,000 in order that they may have something that they can use every day in the year.

The writer recently received information that certain brick roads in Washington county, Ohio, have been built for $11,500 a mile. Such a thoroughfare is to each acre of each section on its either side a cost of less than $10. In other words, the interest charge for such a road per acre is less than 50 cents annually. With thirty bushels of wheat to the acre, or fifty bushels of corn to the acre, hauled away when the market is near its best, or at an average advantage of price invariably as against when it can be hauled away with the road in permissible condition, at least 10 cents a bushel may be gained in the disposal of crops year after year. In other words, an advantage of from $2.50 to $4.50 per acre is always the market advantage enjoyed by reason of good roads, not to say anything of the economy in the wear and tear of vehicles and abuse of horses.

The vitrified brick road is always satisfactory in use because always in repair—never a mudhole or a chuckhole, and practically free from dust; it does not originate dust at all. The traction resistance is so little that the maximum loads can always be hauled. The greatest satisfaction, because it is the exception, in this one peculiar respect—of all the roads that may be built, the brick road is the one road where legislation against its use is never necessary. In many states legislation of this sort against improved highways practically stops their use for weeks at a time, strange to say, when such forbidden or restricted use is the very season of the year when it would be most advantageous to the farmer to put them to his greatest use. Unaffected by the weather, they are equally good during the leisure season as when work is most called for upon the farm proper.

A most important feature of vitrified brick roadways is that their proper construction in all details is easily understood. The essential ingredients that enter into all parts of the construction are not mystified in unknown chemical terms or secret processes. The price of every ingredient is easily obtained. The quantities necessary in the construction are well known, and therefore the actual cost may be easily figured by the taxpaying public. There is no possible opportunity to impose an unreasonable profit upon the taxpayers.

There are a few important details in the construction of a brick roadway any and all of which are easily complied with, but each of which is important in affording the perfect road of its kind. The brick must be of good quality. The concrete foundation must have a smooth surface which shall conform to the grade of the finished roadway. The sand cushion on top of this foundation and underneath the brick must be of uniform 2 inches in thickness, and when the bricks are laid, they must be rolled and compacted thoroughly into this cushion, and, incidentally, the cushion itself must be thoroughly compacted.

In the application of the cement filler, it must be mixed and applied in the proportion of at least one to one and in such a manner that this proportion shall obtain uniformly throughout. The minute method of application, as well as other details in the construction of brick highways can always be obtained gratuitously by application to the National Paving Brick Manufacturers' Association, Board of Trade building, Indianapolis, Ind. The simple directions for the proper construction are readily understood by anyone seeking to understand their importance.

When built in accordance therewith, there is no charge against a highway, and will be none for very many years to come. They are always ready for use and uniformly so in all conditions of weather and at all seasons of the year. They will last a generation without any cost of maintenance. If the doubtful public and the public inquiring for good roads could but spend a day in the inspection and use of the brick-paved country highways in northern Ohio, the question would easily and promptly be settled. These roads afford an example of the best for all purposes with the least cost of maintenance of any like number of miles of highway in the world.

* * *

Tommy—Pop, what is meant by the mother tongue? Tommy's Pop—Sh-h-h, my boy! Don't get her started.—Philadelphia Record.

Decorating the Dining Room

NOW and then one comes across a dining room in which one feels that the architect's work in its finer touches has been subordinated to, or at least guided by, the taste of the owner, says an authority on decorative subjects. I know, for example, an oblong room of stately proportions with a swelled bay at one end, its opening supported by two marble columns showing seven colors, supporting a capital of more than usual delicacy and grace. Two wooden columns, once part of some Sicilian chapel, form the framework of the entrance door, the over door being finished in an arch of the same material and design. A blue, now faded into charming tones, colors the wood, while over this blue there is wrought a design in gold, showing leaves and vines, carved in relief, among which charming Amours disport themselves.

The sideboard, from some other part of the chapel, follows the same design and color. No silver is permanently displayed on it; some rare old drinking cups and chalices are set out instead and protected by glass fitted to the front. For among the blues and golds, it was instantly felt, silver, however rich in itself, would have struck a jarring note.

The wall-spaces of this room are covered with tapestry, in which again the blue is felt, now in a patch of sky, and now in the sweep of a royal robe. The ceiling is carved, the Amours of the columns being repeated here, while the panels are filled with lovely designs in color.

The lights are hidden in the cornice, except for two huge gold candelabra, resting on ornamented columns, which are placed on either side of the room. The chairs are covered with a blue, deep enough in tone to be felt rather than seen, the backs being capped by small gilded ornaments. The curtains are of blue, showing the same charming subordination of tone. Thus the room has everywhere been made to preserve a certain *ensemble,* being tied together by color, as it were, a color so reposeful and enveloping that at no time is one suddenly aroused to look at some special object.

The influence of it all comes gradually, and never as a question of mere magnificence, but as that of a lovely atmosphere in which individual elements of beauty gradually unfold themselves. And this, it would seem, is the final requirement of all interiors. They are first enveloping. You may get their atmosphere at once, be played upon by their color and feel their charm, but the perception of even their unrivalled details must come to you later. Occasions must open your eyes, moods, necessities. They are like the human character in that, and must develop reserve powers, else all you thought excellent at first is a mere flash in the pan, quickly past and forgotten.

No one who goes into the more important houses of the day can fail to be impressed by the fact that two orders of mind have been at work. There is first the colorist, the man who wants richness, warmth, tone, magnificence, at any cost. Then there is the man whose allegiance to the beauty of a line is unswerving, and who will not permit so much as a tone to distract you from the grace of an arch. Imagination has therefore run riot in some of our dining rooms.

Palaces and churches have been robbed to add to their splendors. Superb stuffs and hangings have been introduced, crystal lustres and silver lamps, with those sometimes of brass—that richest and most beautiful of all reflecting surfaces. In what are called our state dining rooms the models for which are either copies or adaptations of famous foreign rooms, the architect has allowed no limitations to his flights, but has gone on piling splendor on splendor, adding arch to arch, and pillar to pillar, splashing on gold with reckless profusion, and hanging crystals wherever their gleam could make for a greater resplendence.

In contrast to these, there are to be found dining rooms which, by very contrast, seem austere, nothing being permitted, even in the way of color, which might possibly interfere with the repose of a given line. I have one such room in mind, the white wooden surfaces of which are broken into panels forming sunken arches of charming design. A soft pale gray hangs at the windows, the sideboard is filled with cut glass, no color being anywhere permitted. Yet, oddly enough, no sense of coldness is conveyed; rather a feeling impossible in any other white room where the touch has been less certain, and the proportions less carefully preserved.

I have seen other rooms where the same attempt has been made, but they have been white rooms relieved by a color, and always demanding the extraneous, to give them a habitable quality. A repose, difficult to describe, steals over the visitor, in this one. The eye, never carried anywhere against its will, is yet made to rest comfortable wherever it strays. The table, too, with its flowers, gains a new quality, becoming as it were the center for disseminating cheer rather than the point toward which the interests converge.

* * *

Ancestry of Mission Furniture

THE coming of the Franciscan fathers to the shores of the Pacific in their propagation of the Christian faith accidentally gave rise to a new style in architecture—a style influenced almost entirely by utilitarian demands upon the ingenuity of the inexperienced builders. The tenets of the austere brotherhood founded by St. Francis imposed upon its members vows of chastity, poverty and obedience, which easily explains the bareness of the original mission buildings. Anything pertaining to ease or luxury was not entertained; comfortable chairs and upholstered seats had no place in the habitations of the good friars, accustomed for years to deprivations and rigid abstemiousness.

Practically the only effort they put forth to depart from the severe plainness of whitewashed walls was in the interior decoration of some of the sanctuaries. There is but little doubt that it would have been better had even these attempts not been made for the buildings would have been more impressive—one might even say more artistic—had the interiors been left in their pristine simplicity. Masses generally lend themselves to beautiful arrangements, and the spontaneous expression of the builder in the necessity of meeting peculiar conditions may result in the production of a style new and dignified. In big things defects are not apparent. The harmonious arrangement of general lines usually gives an artistic result.

It was only in their attempts to embellish their structures with decorations and display of craftsmanship that the builders of the missions failed in producing praiseworthy results. The padres knew little or nothing of drawing, less of color effects. They originated nothing new in these interior decorations because of their limited knowledge of the arts and lack of skill. Naturally their minds reverted to the visions of the marvelous interiors of the Spanish cathedrals—Burgas, the beautiful or the majestic Seville. Hazy memories of these glories guided by unskilled fingers in attempts to reproduce what had once been fashioned by master hands, so that these decorative effects have all the crudeness of the products of primitive minds, and often occasion a smile of derision.

In art, as in everything else, however, the underlying motive must be considered, and since the Franciscan monks earnestly endeavored to beautify the

naves of their churches as best they could with the limited material at hand, although they failed artistically, their efforts are worthy of consideration and respect. The somewhat ornately carved timbers of the Santa Fe mission church illustrate the spirit of reverent sentiment that actuated the workmen probably better than any of the California ones. The devotional love for their holy places prompted the natives to bestow an infinite amount of care upon the carving and to paint elaborately each beam.

Portable furniture of those early days was simple in the extreme, indeed hardly worth mentioning as such. A slab of a tree trunk, sawed and smoothed, with three rough branches for feet, was the seat of the Franciscan monks—tables and settees were of like crudeness. It is a far cry from that to our modern oak or mahogany easy chair, which seems entirely foreign in both form and comfort.

As to that which we designate "mission furniture," whose simple, comfortable, artistic lines make it peculiarly suited to California use, the popular acceptance of it as a descendant of the San Diego or San Fernando craftsmanship is entirely erroneous. Modern mission furniture, notwithstanding our pardonable desire to claim it as our own, is an English product—a style due to William Morris, that prophet of solidity of construction and nobility of line. It is to the genius of that master craftsman that we owe much, indeed, of our present beautiful simplicity of decoration, effective employment of color masses, and harmonious unity of design which is gradually obtaining in all civilized countries and relegating to the background the ornate gilt and pretentious monstrosities of a generation ago.

Morris' artistic soul rebelled against the degenerate style that prevailed in furniture "fashionable" in the 70's—those fantastic shapes—carved, tortured and twisted—finished in ebony, gilt or enamel and upholstered in red plush, and he set about striving to awaken the world to the beauties of genuine, honest handicraft. The creation of furniture along simple lines suggested itself to the directors of various "mission schools" throughout England as a channel through which the dexterity they were striving to encourage in their wards might express itself. With the first exhibition of this mission school furniture in England its popularity was assured and it was straightway imported into the United States, where it met with equal favor because of its novelty—perhaps, too, because it was English. At any rate it was soon in great vogue and its manufacture was taken up by craftsmen in this country, first at Washington, D. C., and afterwards in various other places. Improvements were made as the need arose until the handmade objects now produced under the name of "mission furniture" bear little resemblance to their first English cousins. But with the origination of the style the Franciscan monks of the eighteenth century had nothing whatever to do.

Aside from those purely primitive articles of use fashioned by the Mission fathers, objects quite similar to those made in every mining camp today, one finds that the neophytes built many quaint and curious pieces of furniture which, if they sometimes failed in being delicate or perfect in workmanship, nevertheless had a certain character and charm. In the baptistry of the Plaza Church in Los Angeles is a bench that represents probably one of the earliest efforts in cabinet work among the natives. It is crudely joined, clumsily put together, yet it has good lines, and was built substantially enough to last for ages. The scalloped board across the back is an odd example of the primitive desire to ornament an otherwise plain piece of furniture, and, while it is both unnecessary and undesirable, the humble artisan's mistaken idea of beautifying his handiwork is pathetic.

In many of the missions are to be found similar articles. The lecterns, confessionals, altars, doors and pulpits were often the work of natives, produced for the most part in imitation of those brought from Spain or Mexico, or from prints and drawings in the possession of the Franciscans, they rarely attempted anything new or independent in style.

Besides this class of furniture there were the imported pieces, sent to the missions of Alta California, from Spanish ports, and which are still treasured as fine, interesting mementoes of the early days. The shapes of these are distinctly Moorish in character for the most part, although others are Oriental or Dutch. In the Mission Museum at Santa Barbara is a chair, a relic of the early settlement, that has well-rounded arms, a gracefully shaped back, and although of somewhat plain appearance it has all the charm of an eighteenth century piece of Netherlands craftsmanship. How it found its way to Santa Barbara is a question. The relations between Spain and the lower countries were for a time so close as to have a marked effect upon the art of both, an association of two of the most uncongenial and unsympathetic nations that were ever linked together. The chair may have come around the Horn, or it may have been left on the shores of California by some unknown navigator circling the globe.

In the pulpit of San Luis Rey and the confessional of San Buenaventura we have the highest attainment of early handicraft. Whether these were the work of the friars themselves or of the converts under their direction it is impossible to determine. The pulpit, and especially the closet in which were kept the sacred vessels, at San Juan Bautista, betray the influence of a trained artificer, a man more than ordinarily skilled in the use of tools. The music desk, however, that held the ponderous psalter, is an example of simple line construction worthy of William Morris himself—so, too, are the wooden candelabra and paschal candelstick at Santa Barbara. But with few exceptions there is little about these relics of the Missions to connect them with the designs now common to mission furniture.

With the beginning of the nineteenth century intercourse between Spain and the new colony had become more frequent and there were doubtless adventurous cabinet makers, skilled in all the arts of the trade, who were attracted to the shores of the new world. Soon the work of these men began to replace the crude efforts of the native artisans. The few settlers, secure in their possessions and blessed with abundance, sought to surround themselves with the comforts and luxuries of life and imported from the mother country furniture that was the European fashion of the day. One by one the primitive products of the Mission workshops disappeared; they were left neglected in outbuildings or often ruthlessly destroyed to make way for more elaborate objects.

Like the old "carreta" of the desert, of which there are now only a few curious examples still extant, where a hundred years ago scores or them noisily creaked their lumbering way over the camino real, the first furniture of the Mission padres is to be found in only a few of the old accustomed places, and in the relic rooms of the museums scattered throughout California.—Hector Alliott in the Northwest Furniture Review.

* * *

Loring P. Rixford Resigns

Loring P. Rixford, who succeeded Newton J. Tharp, deceased, as city architect of San Francisco, has resigned and is succeeded by Emil de Neuf, who was Mr. Tharp's assistant. Mr. Rixford has gone East to recuperate. Upon his return he will resume the practice of his profession. Mr. Tharp is the architect of the Bohemian Club building.

Selections from the

ANNUAL EXHIBITION

of the

San Francisco Architectural Club



Fenyes Residence, Pasadena
Robert D. Farquhar, Architect



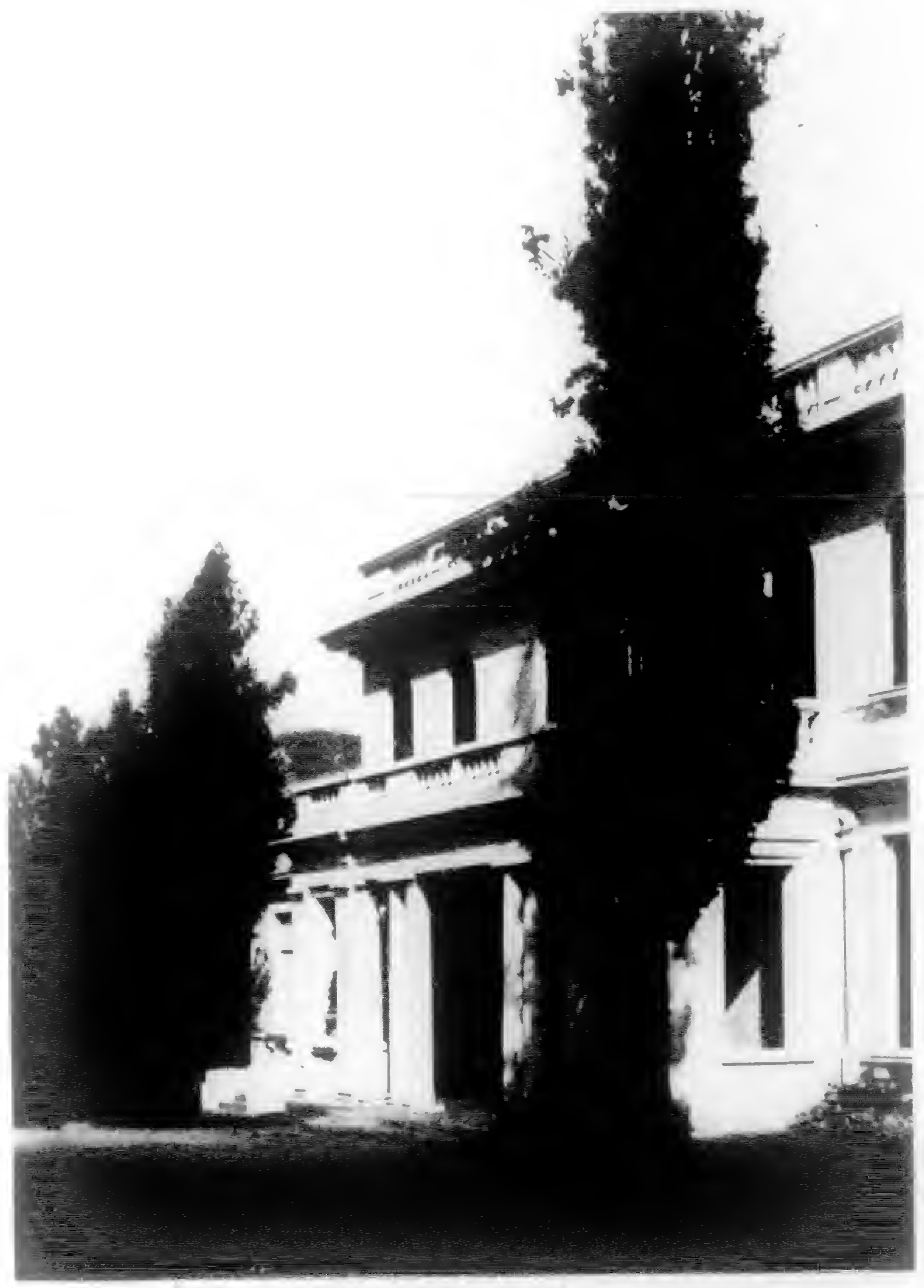
Mission San Gabriel
W. E. Dassonville

Selections from the

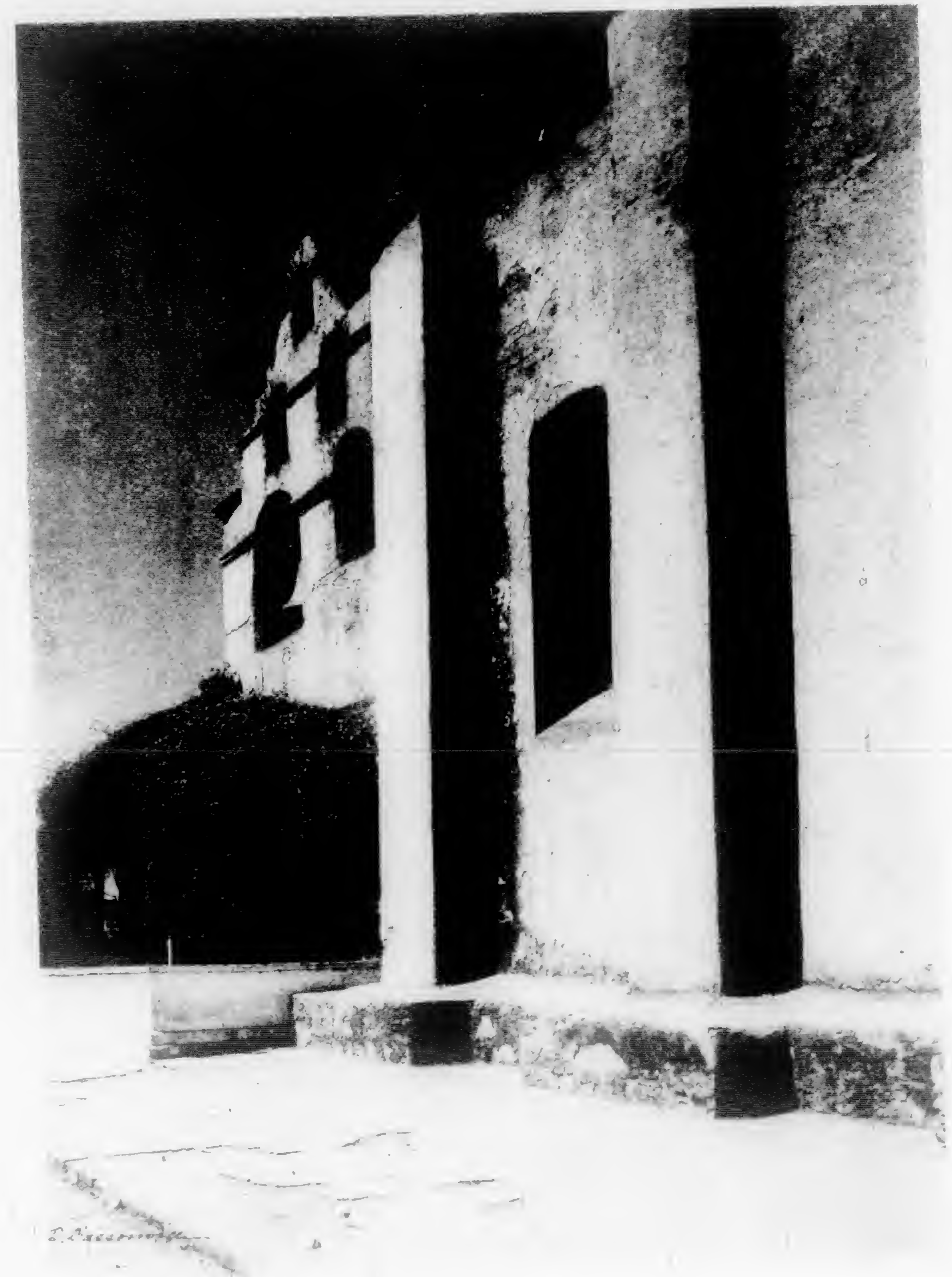
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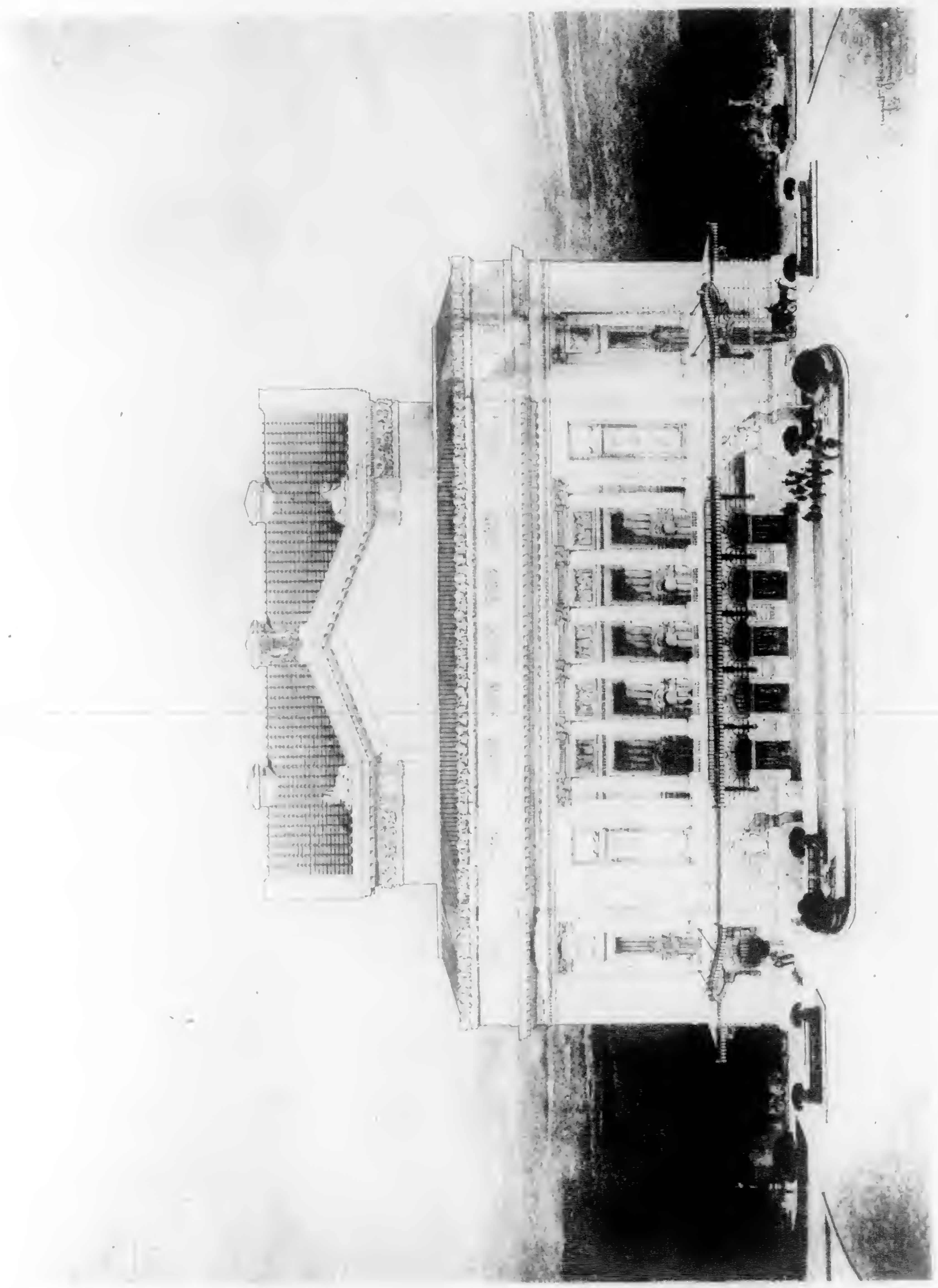
San Francisco Architectural Club



Fenyes Residence, Pasadena
Robert D. Farquhar, Architect

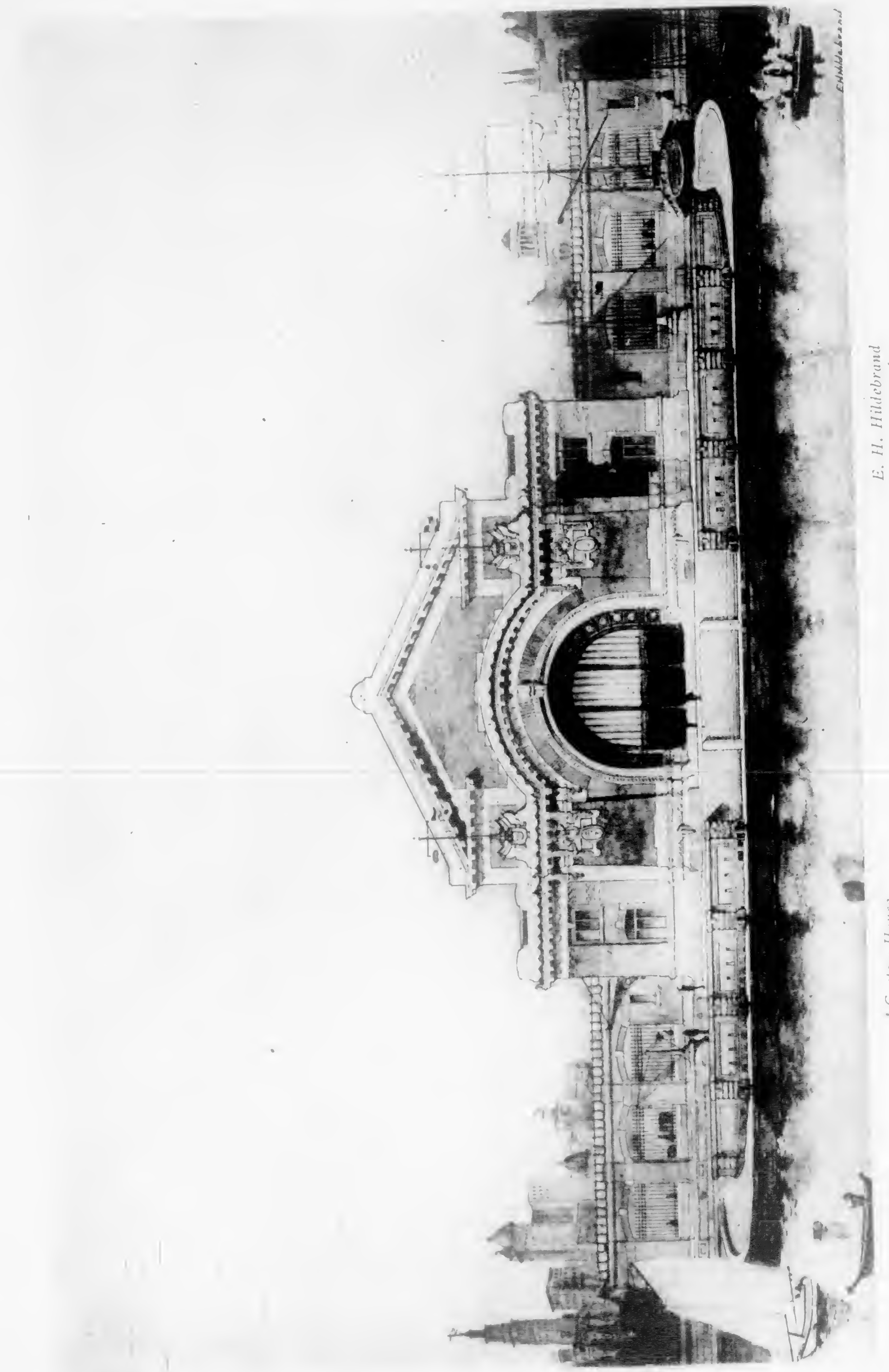


Mission San Gabriel
W. E. Dassonville



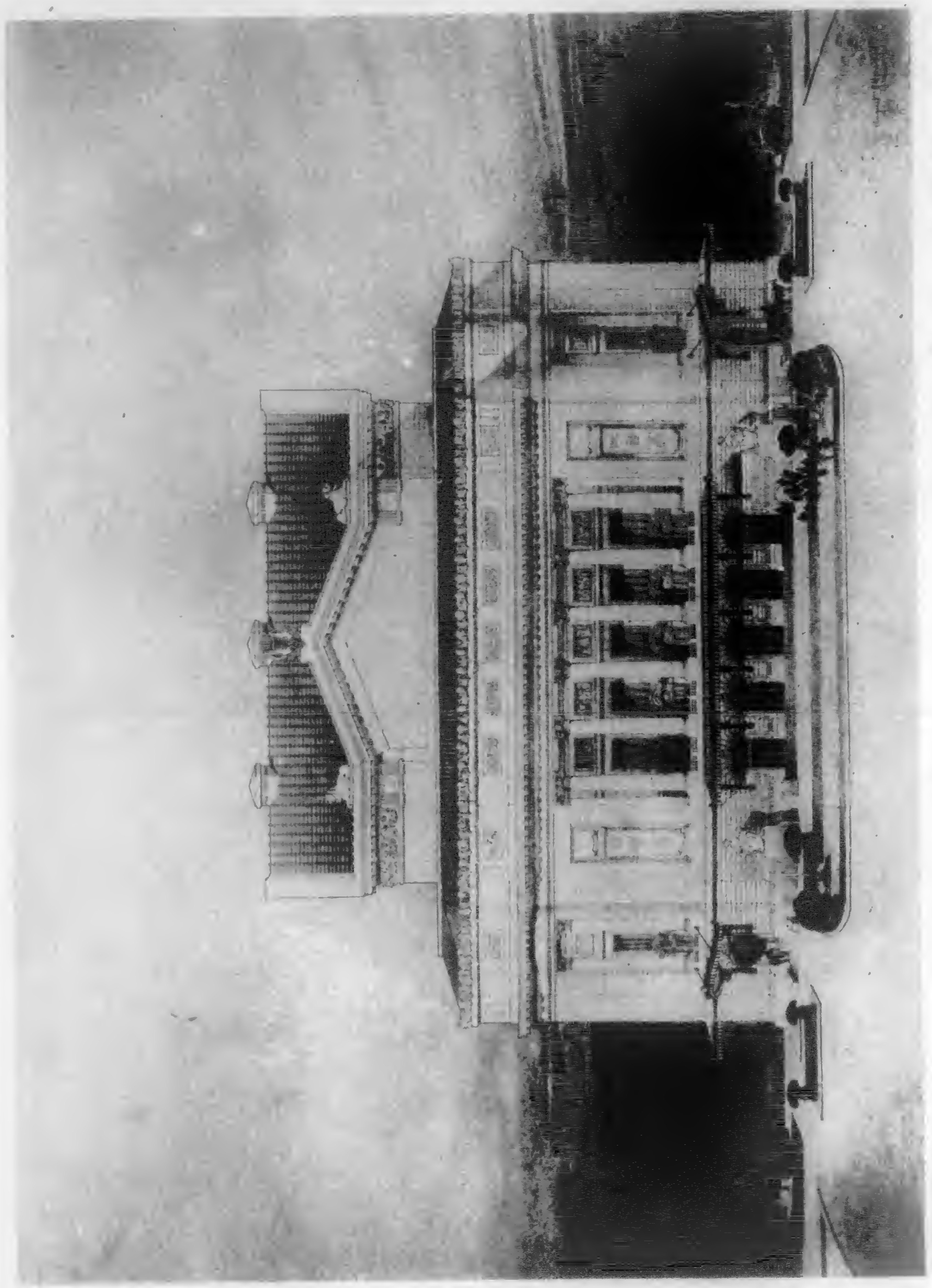
A National Theater, August G. Headman, Architect

Thesis Design, University of Pennsylvania



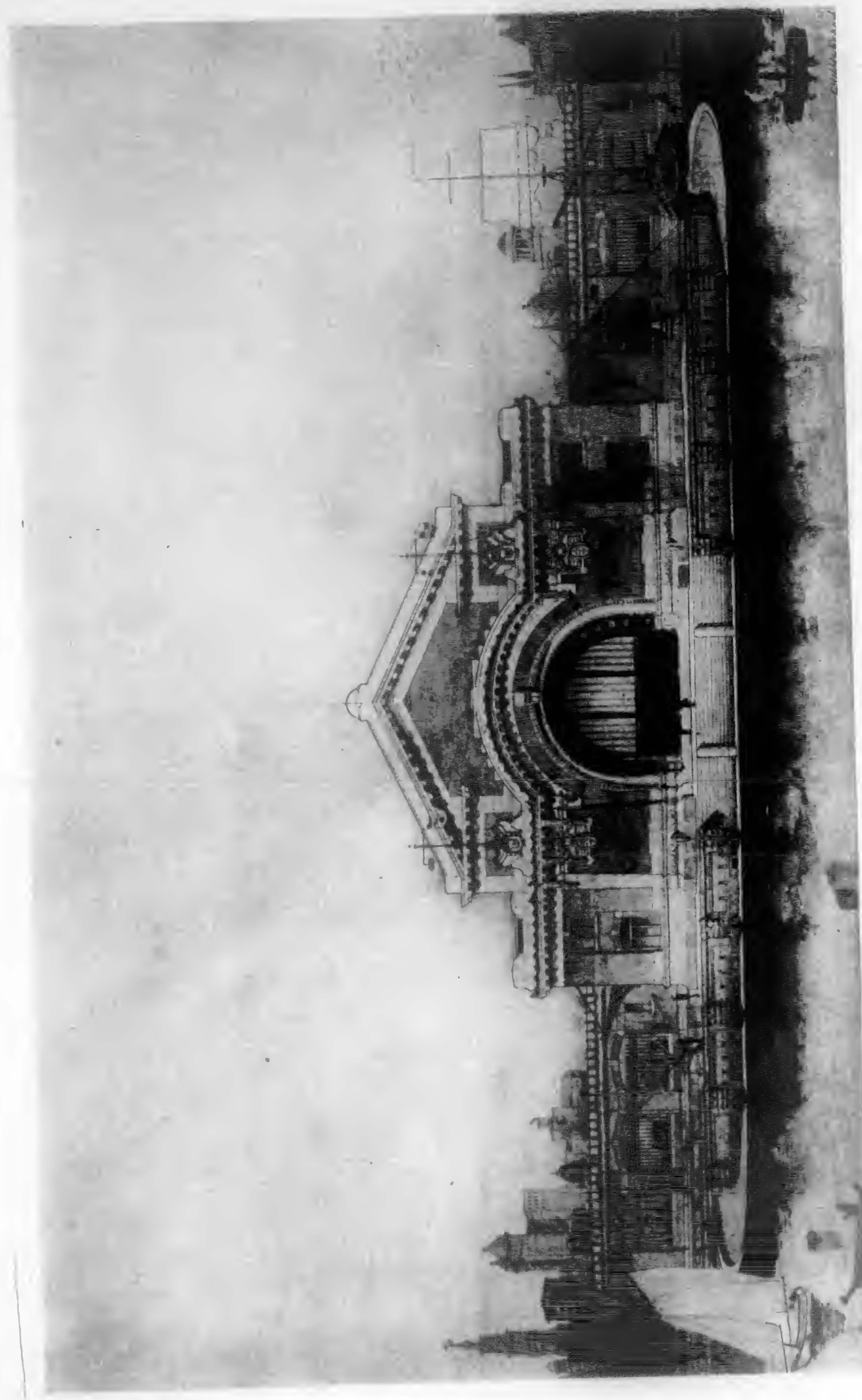
A Custom House

E. H. Hildebrand



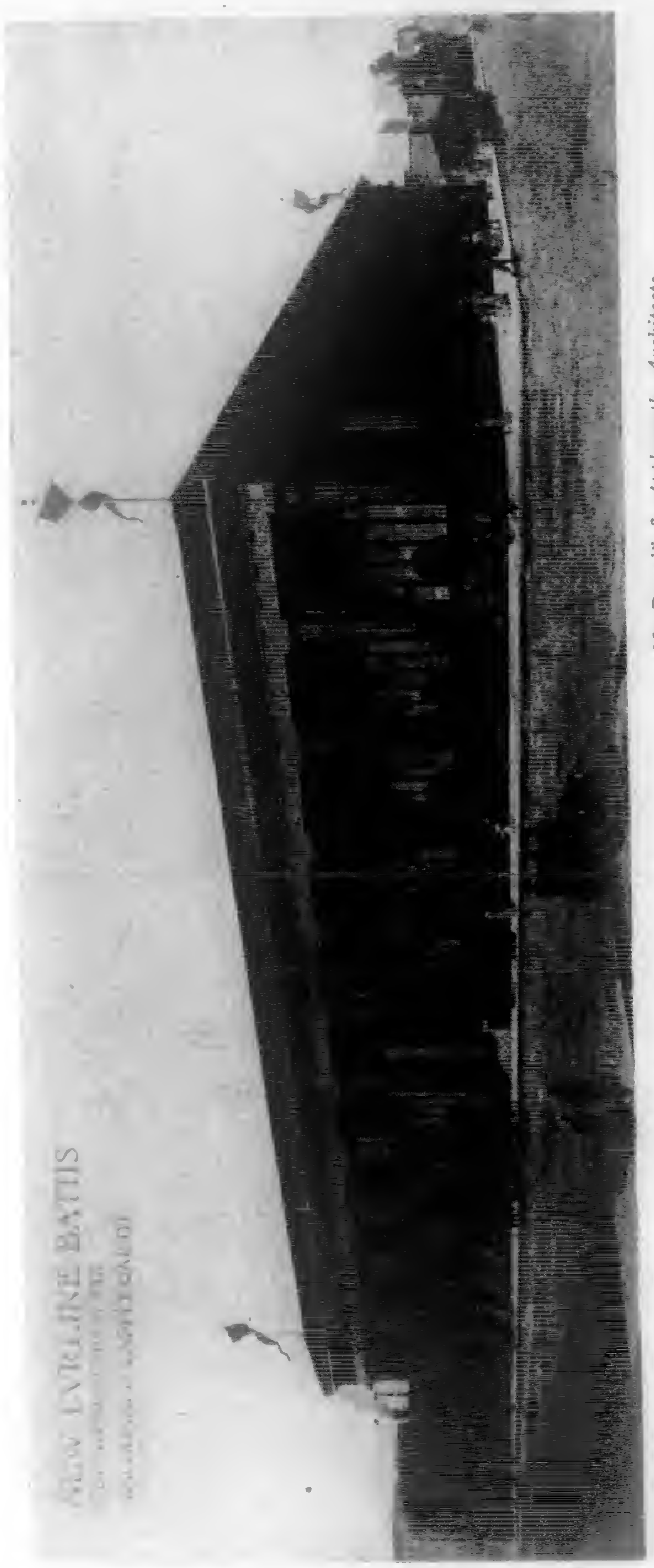
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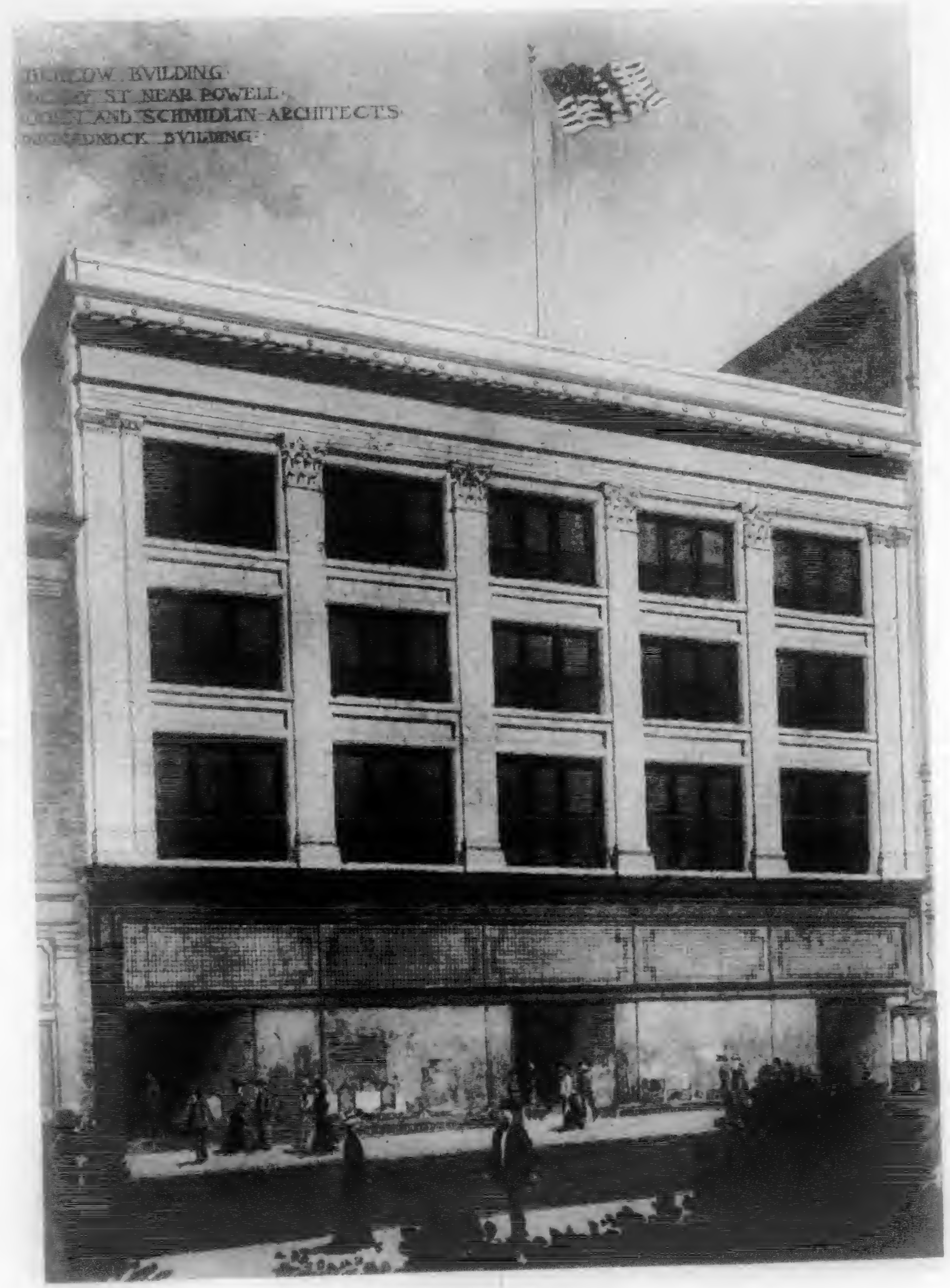


A Custom House

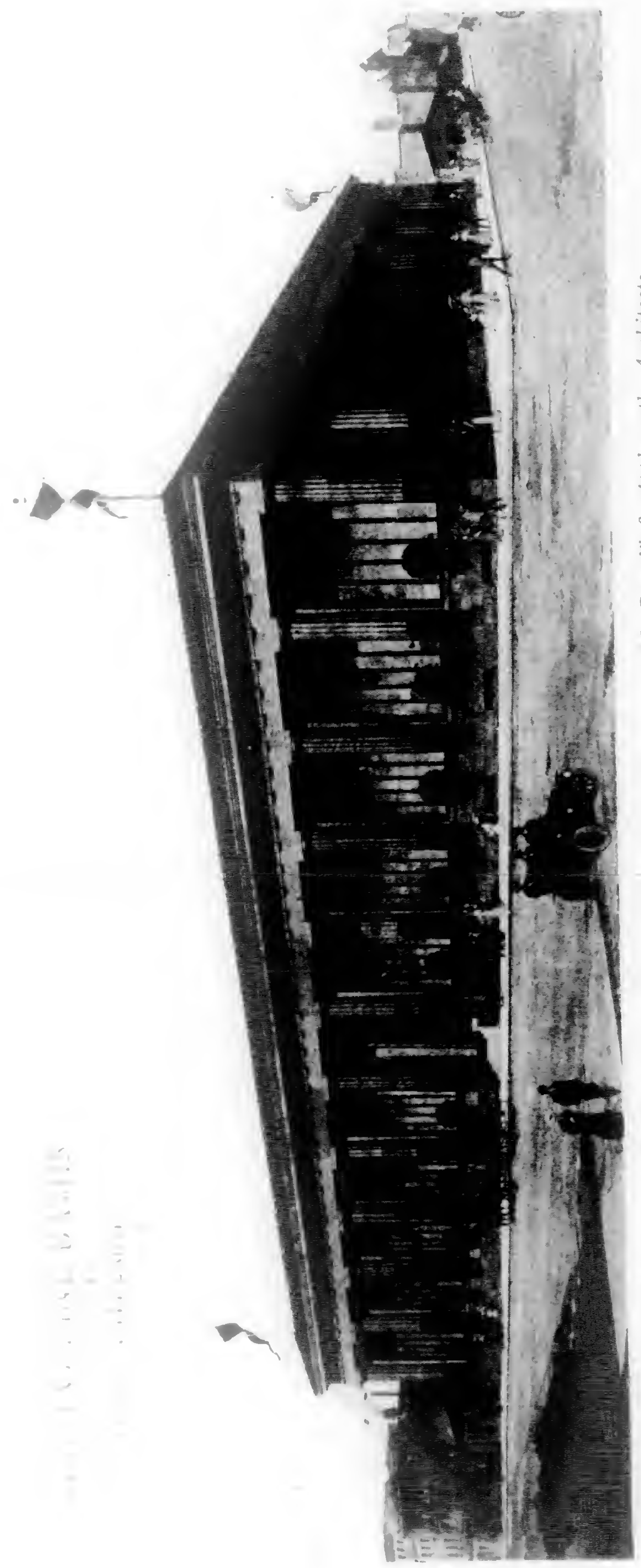
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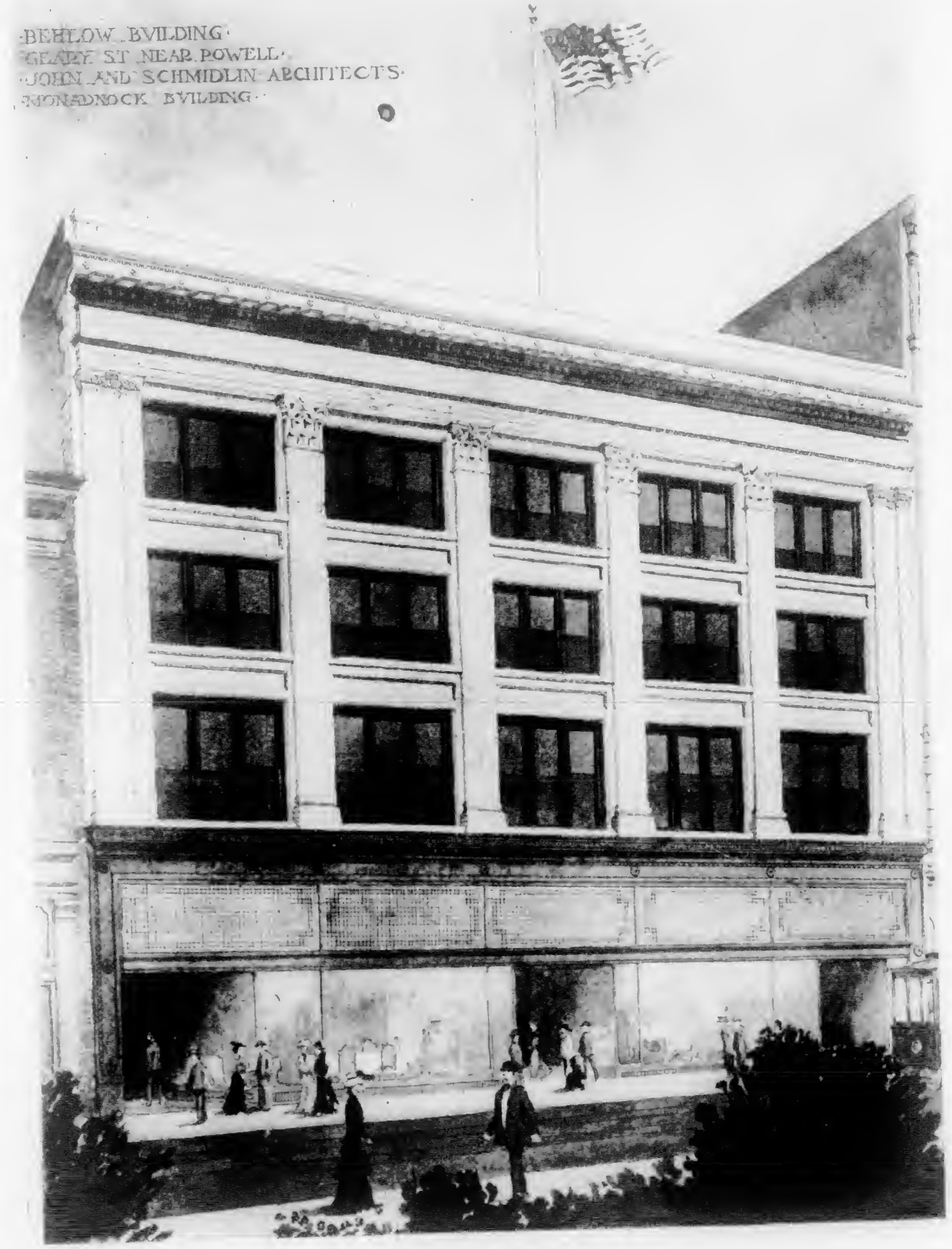
New Lurline Baths, San Francisco
MacDonald & Applegarth, Architects



Behlow Building, San Francisco
John & Schmidlin, Architects



New Lurline Baths, San Francisco
MacDonald & Applegarth, Architects



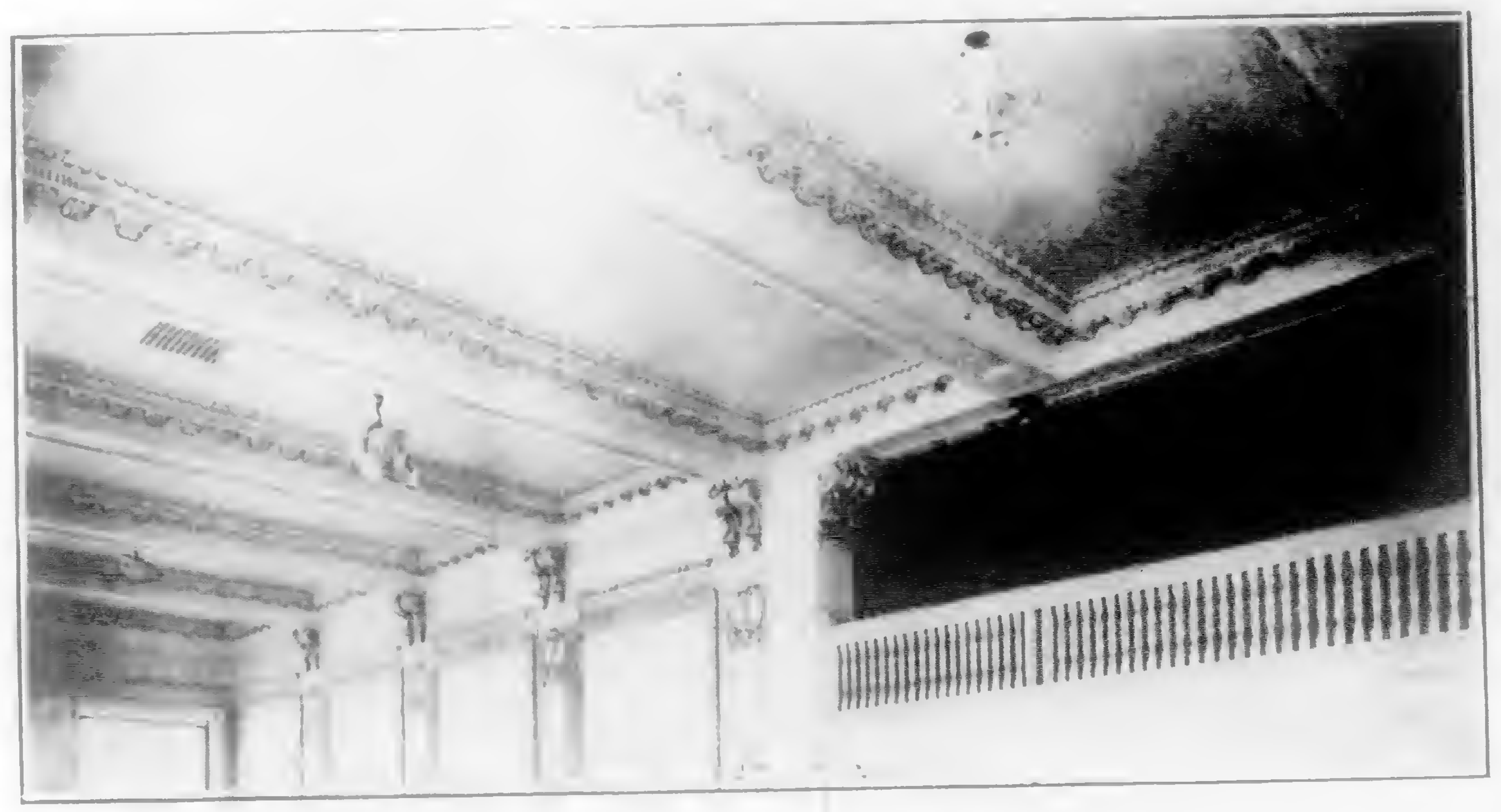
Behlow Building, San Francisco
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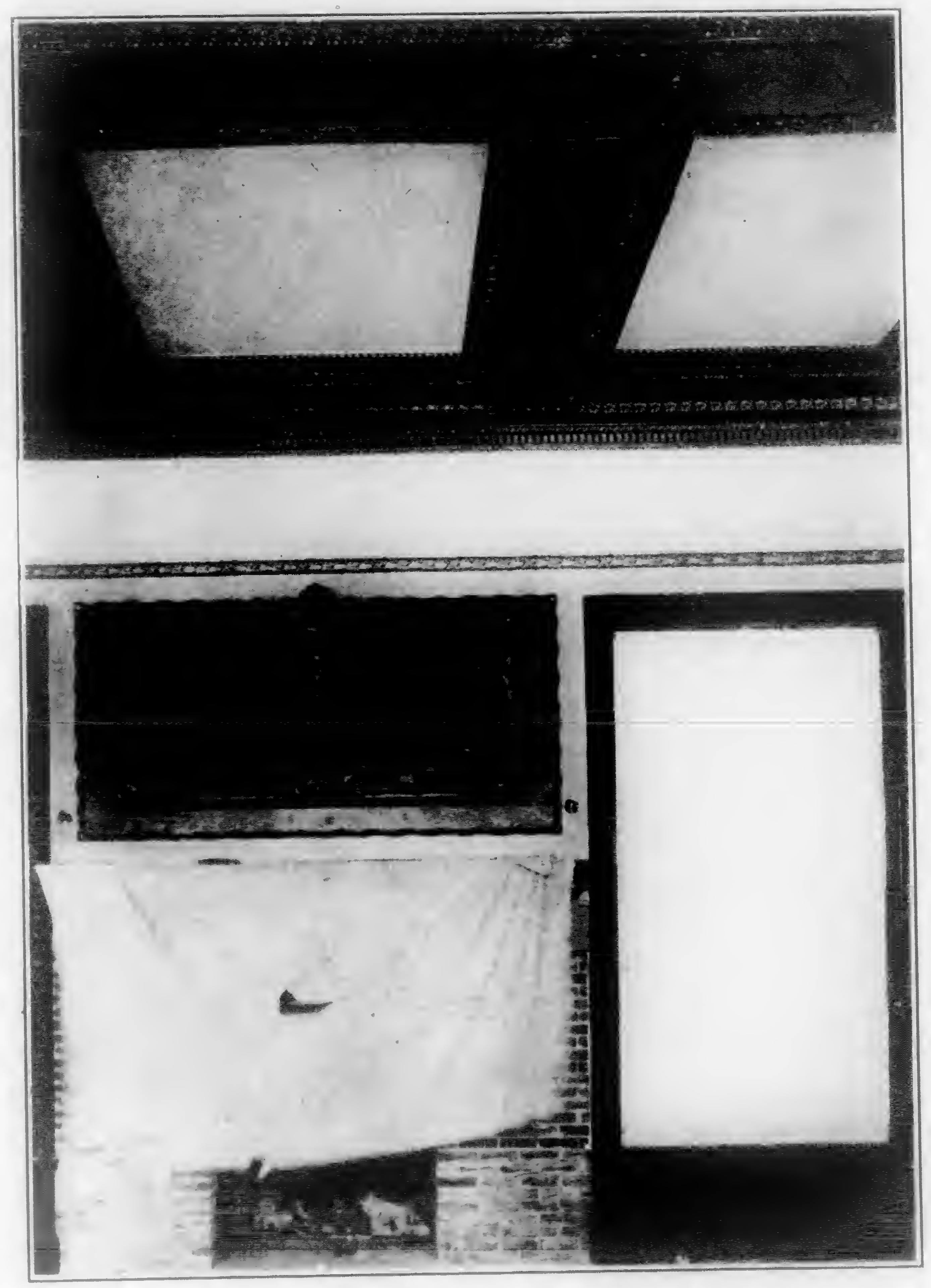
Frieze, Showing the Old Cliff House



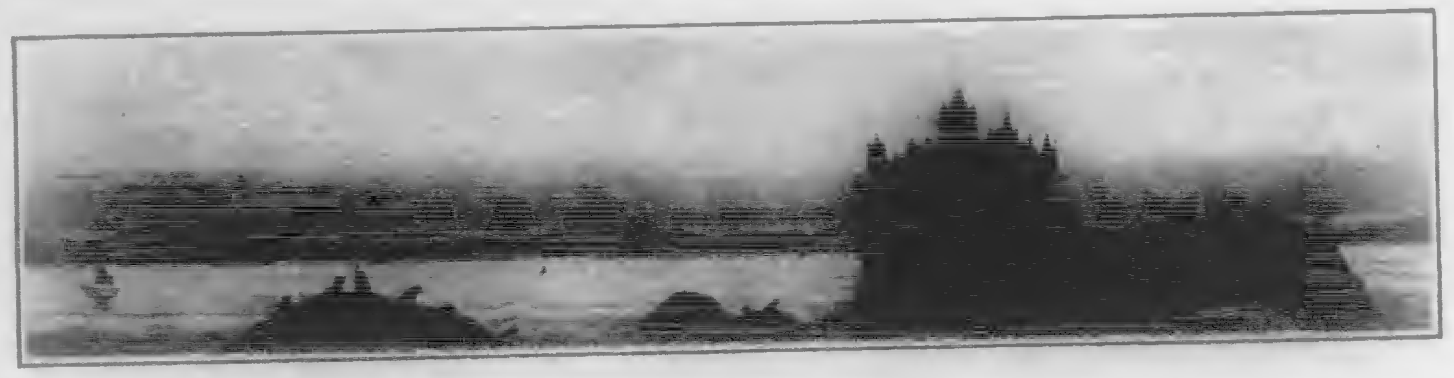
The New Cliff House, San Francisco
Reid Bros., Architects



Interior Cliff House, San Francisco
Plaster Work by D. Ross Clarke



Interior the New Cliff House, San Francisco
Plaster and Stucco Work by D. Ross Clarke *Reid Bros., Architects*



Frieze, Showing the Old Cliff House



The New Cliff House, San Francisco
Reid Bros., Architects



Interior Cliff House, San Francisco
Plaster Work by D. Ross Clarke



Interior the New Cliff House, San Francisco
Plaster and Stucco Work by D. Ross Clarke Reid Bros., Architects

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Wants Cornice Removed.

Architects and builders are following with considerable interest a suit recently filed by one Isaac Kohn against United States Senator George C. Perkins to compel the latter to remove from his office building at the corner of Kearny and Bush streets, San Francisco, a cornice which Kohn claims projects four feet over the plaintiff's adjacent property in Kearny street. Notwithstanding that Perkins admits the cornice overlaps his neighbor's property, it is stated he has repeatedly refused to remove it.

Kohn, who is a wealthy property owner living at San Anselmo owns the lot between Perkins' eight story building and the Stanford Hotel. A four story building stands on Kohn's lot, but he plans to run it up to a height greater than that of Senator Perkins' building. The only obstacle in the way of the con-

templated improvement is the overlapping cornice.

In praying for an order compelling Perkins to remove the cornice Kohn states that he does not ask for pecuniary damages because such compensation would not afford him adequate relief.

The building of Senator Perkins was erected more than two years ago. If he were permitted undisturbed to use it for five years his right to the maintenance of the cornice could not be challenged.

Los Angeles Chapter, A. I. A.

The Southern California Chapter of the American Institute of Architects at its regular monthly meeting in November elected the following delegates and alternates to the Forty-third annual convention of the Institute: Delegates, Octavius Morgan, A. F. Rosenheim, C. H. Brown, Frank D. Hudson; alternates, Messrs. Hunt, Austin, Eisen and Parmentier.

The members present took a decided stand against the proposed change in the ordinance regulating the height of buildings in Los Angeles and appointed the following committee to act for the chapter: A. F. Rosenheim, chairman; John Parkinson, A. B. Benton, John P. Krempel, Fernand Parmentier. The chapter put itself on record as opposed to a greater height of buildings in the business district than now allowed.

Action was also taken on the question of better schoolhouse construction, the chapter appointing a committee consisting of A. Rosenheim, John P. Krempel and R. B. Young, to go before the school board with plans for a model fireproof building and estimates on the cost of its construction. Plans in detail were prepared for such a structure by Mr. Rosenheim.

A resolution was presented on the Preservation of California Missions by Mr. Benton, and ordered spread on the minutes.

Among the guests present was Mr. Joseph Jacobberger of Portland, a prominent architect of that city, who delivered a talk.

Resolutions of condolence upon the death of the late Architect Peter August Westberg were adopted, ordered spread on the minutes and a copy sent to the bereaved family.

The following were announced as having been admitted to membership in the chapter: B. B. Bixby, B. Cooper Corbett, W. F. Thompson.

Architects Sue For Fee.

An action has been commenced in the Superior Court at San Francisco, by Frank T. Shea and John O. Lofquist, architects, for fees, alleged to have been earned two years ago in construction of the Union Square Hotel at the northwest corner of Stockton and Post streets, San Francisco.

The hotel building is the property of Mrs. Blanche Burbank. It is a seven-story structure covering one-half of a fifty vara lot.

According to the records the amount of the architects' bill is $13,250. An attachment was placed on the property on November 5th for that amount. According to Mr. Lofquist, there has been no dispute about the bill for services in construction of the hotel building. The trouble has been in enforcing a payment of the fee. The work was done two years ago and the firm has expended large sums for which it has not been reimbursed.

Architects Sued.

The American Biscuit Company, which was sued by Ralph Warner Hart for $10,323 for services as architect in the erection of a reinforced concrete factory, has filed an answer and cross complaint claiming $29,000 from the architect. Mr. Hart is a reputable San Francisco architect.

A suit for $10,000 damages for libel based on a letter written from one business firm to another, has been instituted by Mayer Walk, house painter, against Macdonald & Applegarth, architects.

Walk was subcontractor for the decoration of a building being erected by the Healy-Tibbitts Construction Company upon plans prepared by Macdonald & Applegarth. The architects are accused of having written to the Healy-Tibbitts company a letter in which appeared the following:

"This man is so hopelessly incompetent and his work is so abominable that we feel like having it all burned off and done over by a good painter to protect ourselves."

These words are false and defamatory, Walk alleges.

A Block of Fine Homes.

Architects Nicholson & Company, Pacific building, San Francisco, have made plans for five duplex residences costing $7,000 each, for the Pacific Realty Co.

This group of beautiful homes is to be erected on Presidio Grove Lane, near Union street, and will occupy nearly a complete city block. The property is situated in one of the finest of San Francisco's residence sections. The lots all lay along a steep grade and no one residence will obstruct the view of another. One of the pleasing features of the property is the fine marine view obtainable from anyone of the home sites.

Two of the residences will be two-stories above ground, while the balance will be of the one-story and finished basement type. The slope of the ground is such that all basements will be practically ground-floor rooms.

Oakland Public Building Competition.

THE Oakland Board of Public Works will soon hold an architects' competition for plans for the new municipal buildings on the city hall site. Conferences have been held by the members of the board with delegates from the San Francisco chapter of the American Institute of Architects, under whose rules the contest will be conducted.

The architects present were George B. McDougall, Manker O'Brien and William Mooser. They explained the method of conducting the competiton and on their advice the board will proceed.

First an advisory architect will be appointed. He probably will be a Pacific coast architect and he will prepare guide drawings showing the shape of the city hall property, the plan on which Washington street is to be extended to San Pablo avenue, and the number of offices required in the administrative buildings.

As complete a description as can be prepared will be included in the call for plans. The board figured that 60 days would be required for the architects to make their drawings and designs. After the winner of the contest has been named 60 days more will be needed for completion of the details. At least 30 days must be allowed for unavoidable delays and 30 days for the legal advertising for bids on the structures. This will defer the time of laying the cornerstone of the city hall until next July. Mayor Mott suggested July 4th as the most suitable date.

The architects suggested that six prizes should be offered so that the competition would bring out many plans. The amount of the first prize is to be fixed by the board. The others will be: Second prize, $3,000; third, $2,500; fourth, $2,000; fifth, $1,500; sixth, $1,000.

The amount of the bonds voted will cover this expense and provide the $1,000,000 needed for erecting the city hall.

Splendid Theater for San Diego.

Quayle Bros., architects, 229 Granger Bldg., San Diego, are preparing plans for a beautiful theater building to be erected at the corner of Third and C streets for Fulkerson & Palmer. The building will be a two-story brick structure, with pressed brick front and composition roofing. It will be 94x150 feet in size, and will contain twelve offices on the second floor, besides the theater. The lobby will be in the C street frontage, and will measure 16x29 feet. On each side of the lobby will be a storeroom of the same size, and five similar stores will occupy the Third street frontage. The stage will be 80x34 feet, and will be separated from the auditorium by a steel curtain. The body of the theater will be 72x80 feet, and will contain 860 opera chairs and four boxes. The balcony will seat 600 persons. The building will be equipped with heating system, ventilators, eleven fire exits, fire-escapes, etc., and will cost about $75,000.

Coming Architectural Exhibition at Los Angeles.

The Architectural League of the Pacific Coast will hold its third exhibition at Los Angeles, January 3d to 16th, under the direction of Mr. M. A. Vinson. Mr. Vinson's chief work will be the publication of the "Year Book," and he is offering a prize of architectural books to the extent of $25 for the best design for a title page. A prize of $25 is offered by A. F. Rosenheim for the best design for the cover, and a similar prize will be given by Hudson & Munsell for the best design for a "Poster." The office of the exhibition committee is at 1411 Union Trust building

One of the principal attractions at the coming exhibition will be an exhibit of one hundred and twenty-five frames of "mural paintings" by Edwin Howland Blashfield of New York City, one of the foremost artists of the country. These paintings are now on exhibition in Denver, and through the efforts of Mr. Vinson and the exhibition committee, Mr. Blashfield has consented to allow them to be exhibited in the Southern California metropolis. It is expected that this and other fine attractions which will be provided will draw a large attendance upon which the success of the undertaking depends. The exhibition will be held on the fourth floor of the Hamburger building.

Los Angeles Architectural Club Meeting.

The first meeting arranged by the entertainment committee of the Los Angeles Architectural club was held the latter part of November in the club rooms in the Union Trust building. An interesting program was provided and several speeches were made by invited guests. A feature of the meeting was an exhibition of sketches and designs in art glass furnished by MacKay & Co. A Dutch lunch contributed materially to the pleasure of those present. It is the intention of the committee to have one of these entertainments, including a program and Dutch lunch, each month, and it is expected they will become quite popular with the members.

$45,000,000 for San Francisco's Water Supply.

City Engineer Manson of San Francisco estimates the cost of the proposed municipal water system with sources of supply in the Sierra at $45,000,000.

The City Engineer prefaces his figures as to the water supply system with the statement that they constitute "estimates for furnishing the City and County and its inhabitants with a sufficient supply of water for all purposes from Lake Eleanor, Tuolumne river and its tributaries, Tuolumne county."

"The storage and delivery system," continues the Engineer's report, "are designed to supply, under the present development, 60,000,000 gallons of water per day, the service reservoirs in the city to hold six days' supply, the distributing system to serve 15,400 acres with a population of 735,000.

Following are the items that go to make up the total of $45,000,000:

Item	Amount
Lake Eleanor Division	$ 1,834,525
Tuolumne Division	3,285,400
Foothill Division	1,708,500
Valley Division	9,118,700
Bay Division	12,792,100
City Division	11,100,000
Real estate and right of way	1,000,000
Contingencies, engineering, etc.	4,160,775
Total	$45,000,000

The City Engineer calls attention in concluding his report to the fact that his plans and estimates "provide for a power development fully equal to all pumping requirements, and do not include the development of the Hetch-Hetchy reservoir."

Consideration of the latter feature of the original Sierra water supply plan is omitted altogether from the project as it is now being dealt with because of the requirement of the federal authorities that the Lake Eleanor source of supply shall be developed first.

The Clay Products of California.

The yield and value of the mineral substances of the State of California for the year 1908 are to be made public in the form of a pamphlet that is now in the hands of the state printer and will be issued soon in complete form. In the list of mineral productions of the state clay products occupy fourth place. The total value of structural materials in 1908 was $10,132,179 and of this more than one-fourth was for brick, terra cotta and other products of clay. Of this brick comprised a value of $2,506,495 while pottery products were valued at $325,147. According to the list compiled by the State Mineralogist brick clays were utilized in the following counties of the state: Alameda, Contra Costa, Fresno, Humboldt, Imperial, Kern, Kings, Los Angeles, Marin, Mareda, Mendocino, Merced, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Shasta, Solano, Sonoma, Tehama, Tulare, Amador, Monterey, Placer, Stanislaus, Yuba and Ventura.

Clay for pottery came from Alameda, Amador, Calaveras, Los Angeles, Placer, Riverside, Contra Costa, Fresno, Orange, Santa Cruz, San Joaquin, Solano and Ventura. All of the fuller's earth came from Kings county and the glass sand from Alameda, Los Angeles and Monterey counties. The most marked development during the past ten months in the clay line in California has been the opening and developing of new beds of fine pottery clays and within a short time it is expected that the use of this material will be greatly extended. The products of the clay beds located above Sacramento are declared to be equal in quality and beauty to those of any beds anywhere in the country and it is here that so much work is being done preparing to market the product on a large scale. The use of tiling and terra cotta facing has become very noticeable in San Francisco and is steadily growing.

Personal.

W. L. Cooper, manager of Robert W. Hunt & Company's European business, has returned to London after the completion of his annual business trip to the United States.

Architect Henry C. Smith has moved from the Mechanics Bank building to the Humboldt Bank building, San Francisco, where he has an attractive suite of offices. Mr. Smith's new phone number is Kearny 1745.

San Francisco Chapter, A. I. A.

A special meeting of the San Francisco Chapter, American Institute of Architects, was held at Tait's Cafe on Thursday evening, November 18th.

The principal business transacted was the election to Chapter membership of Messrs. August G. Headman and Albert Schroepfer and the election of Mr. John F. Stimson to associate membership; the adoption of the secretary's annual report; the appointment of Messrs. John Galen Howard, Louis C. Mullgardt, William Curlett and Henry A. Schulze as delegates to the Annual Convention of the Institute at Washington, D. C., December 14th to December 16th, and the appointment of standing committees to serve for the current year on the entertainment and reception of visitors and convention, legislative, commercial bodies, headquarters, competitions, fine arts and city adornment, building laws committee and the revision of the constitution and by-laws of the Chapter.

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UNSAFE BUILDING MATERIAL

Our attention has been called to the fact that since the rush of building operations began shortly after the fire of April, 1906, a very considerable quantity of faulty building material has found its way into consumption in San Francisco.

Some of this material was purchased because it was cheap. Some of it has cost contractor and owner all that first-class material could have been bought for. The unfit nature of much of it was fortunately discovered during construction, and it was thrown out, but it caused no inconsiderable delay and dissatisfaction. There is no doubt whatever that much of it has gone into buildings where it forms an element of serious danger.

There are many materials, the essential qualities of which mere cursory examination will not determine, but which can be determined at comparatively small expense by submitting them to properly conducted expert examination. Sometimes this examination is necessarily chemical or analytical. Sometimes it is physical, but of such a nature as to require special testing apparatus. Some large and continuous users of such materials, the great railway companies for instance, maintain testing departments equipped with both chemical and physical laboratories where they test almost all the materials and supplies they consume. It pays them to purchase protection and safety in this way. Many of the large cities of the East also maintain testing laboratories for proving the quality of the numerous building materials which they are compelled to purchase. The municipal government of San Francisco now has under way the installation of a plant of this description.

Architects owe it to their clients to see that proper inspection of materials is made before the latter are put into a building. Of course we don't expect that every architect will maintain his own private inspection bureau—that would entail uncalled for expense, but there are professional inspectors in every large city whose services may be had at small expense.

REINFORCED CONCRETE CONSTRUCTION AND THE STEEL INDUSTRY

A few years ago when reinforced concrete moved up to a place alongside of the other important structural materials in the building world, the steel manufacturers were very apprehensive as to the effect of this advance on their business. The bulk of the steel business had heretofore been in steel rails and structural steel members. Would the introduction of reinforced concrete wipe out the latter part of the steel business?

Time has answered the question in a way surprising and cheering to the manufacturers of steel. In the past several months the steel mills have not been running full capacity and the Iron Age, an organ of the steel trade, calls attention to the fact that the mills rolling steel reinforcing bars have practically supported the industry. Steel manufacturers have come to see that reinforced concrete requires steel bars. The special rolls, the additional attention necessary in getting the steel to conform to a certain chemical standard and the necessity of cutting the bars in various lengths all add to their cost. The mill gets a good price from the concrete people and takes off a fair margin of profit.

The growing popularity of cement plaster construction has increased the demand for steel fabric. Small concrete products require, in many cases, steel wire reinforcement. All these demands upon the steel industry operate to the profit of the mills and what at first appeared a menace has proved to be a blessing in disguise.

FIRE PREVENTION

The New York World declares that one of the most effective measures yet devised in the direction of fire prevention is the labelling of buildings that was suggested by Architect Fitzpatrick, of Washington, D. C., the Executive Officer of the Society of Building Commissioners.

The World quotes from that expert:

"It is immediately necessary that the authorities should conspicuously label every building of public or semi-public nature, just as to its class of construction, 'fire-proof,' 'ordinary,' 'dangerous.' As it is now, the term fire-proof is cruelly abused. It is applied where there is not the slightest foundation for its use and is made the means of obtaining tenants and occupants under false pretenses. A man with 'dangerous' affixed to his building would have difficulty in renting it and that would be a powerful incentive to him to at least make the building better if he did not absolutely eliminate it and build correctly. Then we should have the same municipal regulations that they have in most European cities relating to 'neighboring liability.' Here we have a selfish way of taking care of ourselves and letting the other fellow shift. There they make you responsible for any damage to your neighbor's premises or property that may result from a fire in your premises caused by your or your agents' carelessness or negligence. It makes people wonderously careful in handling their ashes, waste paper, etc. These neighboring damages are always collectible at law in Europe and the regulation is one of the most effective of fire-preventive measures."

A Tribute to Cement.

Architect Octavius Morgan, lately elected a Fellow of the American Institute of Architects, at a recent banquet of the Los Angeles Architectural Club took occasion to pay a tribute to cement, saying in substance:

"We have not thought much of cement in the past, but it is one of the most wonderful of materials. We in Los Angeles and in Southern California, have some of the best examples of plastic cement work in the country, yes, in the world. What has been accomplished is merely suggestive of what can and will be accomplished in the future with cement. You young men want to give it thought."

Mr. Morgan called attention particularly to the artistic possibilities of cement as a moulding material, stating he was astonished with the results that could be obtained with its skillful handling.

HEATING AND LIGHTING

THE LIGHTING OF CHURCHES*

By Bassett Jones Jr., Consulting Electrical Engineer.

In this article no pretense is made of laying down any hard and fast rules governing the lighting of churches. Any generalization on the subject would be an absolute waste of time. Churches vary so widely in design, environment, and the uses to which they are put, that each problem becomes a distinct study in itself, and nothing more than suggestions as to the method of approaching each case will be attempted.

No other instance of the use of artificial light presents such inherent complications, or demands an approach from so many sides. In the first place, church lighting is only to a very minor extent an engineering problem—indeed this is true of any building possessing aesthetic features to any marked degree, and to make clear our attitude on this question of illuminating engineering we shall quote from a recent paper read by the author before the Illuminating Engineering Society: "The beauty and effectiveness of good architectural construction, both from aesthetic and utilitarian standpoints, depend upon a strict adherence to the principles of architecture outlined above, and the feeling of the design, dependent as it must be upon historical precedent, is bound by centuries of usage to certain effects of color and light which have become established because of their appeal to the sentiments aroused by pleasurable visual perception. The business of the illuminating engineer is to modernize old methods of illumination without destroying them. If we are to discard tradition altogether, then we may as well abandon the architecture of the past, and ignore its influence. This, as I have tried to make evident, is impossible, if not on aesthetic grounds, then on physiological grounds, and to deny its demands would be suicidal. * * * The illuminating engineer who imagines that he will be permitted to introduce anything radically new into the illumination of buildings possessing historic feeling is doomed to disappointment. Rather is it his duty to maintain and conserve that feeling in spite of modern appliances and means. * * *

"The 'feeling' of the design must be carried out consistently even to the last detail of the fixtures. It is the duty of the architect to see that this is done. His conception of the whole arrangement must include the lighting, for, as he sees it 'in his mind's eye,' so must it be seen objectively. The light that must be provided, its tone, its intensity, its quality, is a feature of his mental conception, and it is the ideal illumination that the engineer must seek to approximate. Of course, he can only hope to do this when he, too, is able to see the design as the architect sees it, and not through the eyes of the illuminating specialist alone. The engineer must be able to discern where direct or indirect illumination is required, and the kind of fixtures associated historically and aesthetically with the general design by means of which he must obtain the proper results. * * *

"It seems, then, that a very important if not essential feature of the engineer's preparation is a study of the history of illumination and its relation to architectural design. He must make himself intimately acquainted with the means, methods and results of earlier work, and good work it is where any attempts were made to obtain adequate and suitable lighting. Because we alone can formulate and employ the laws governing the distribution of light, we must not think that good lighting has not been earlier achieved by empirical methods. We are simply in a position to do with less expenditure of energy what the masters have done in spite of their manifest limitations. * *

"The question as to the proper location and arrangement of fixtures then resolves itself into the question as to the way in which the design is to be seen. The proportions of the structure, its construc-

*Extracts of an article by Mr. Jones in The American Architect and copyrighted, by The Swetland Publishing Company.

When writing to Advertisers mention this Magazine.

tive lines and the points where they originate and end—these are to be brought out in relative prominence, and to do this properly the individual responsible for the lighting must be able to discern and select these features and modify his illumination accordingly. * * *

" * * * it is the writer's belief that no architectural design, conceived in the right spirit, and properly executed, can demand any suitable artificial illumination that is injurious in the optical sense. * * * Artistic illumination is, ipso facto, good illumination. And no illumination can be artistic that is not conceived as a feature of a truly artistic design."

It must be clear to everybody that no design is perfect that cannot be properly seen; for the perfection is not a quality that lies directly in the design, but is a quality of mental activities aroused in the judicial beholder when the design is presented as a stimulus to his mental functions. It is nonsense to talk of the beauty of an unseen or unheard work of art.

Thus, in architecture, it appears that the most important thing after production of a good design is to arrange it so that it can be seen as the designer means it to be seen, and to him this seeing is an integral part of his conception. The self-exploiting basis of art is emphatic in its demands. Granted, then, the importance of properly seeing a design, the next question is concerned with the means of providing proper illumination.

That the great architects of Greece and Rome and of the Renaissance period considered this matter of proper lighting of great importance, is evidenced by the thoroughness with which the illumination of each interior was worked out even to the smallest detail of the fixtures. Furthermore, the fixtures themselves were never an after-thought, but formed an integral feature of the entire design.

The preliminaries to the selection of a method of artificial illumination and the design of suitable fixtures consist in determining the character of the following factors:

1. The purpose indicated by the type of the structure. If the building is a church, to what denomination does it belong — Roman Catholic, Dissenting, Jewish, Christian Science, etc? The character of the service will be a prominent feature in the problem of lighting. A Roman Catholic Church having no congregation singing or reading will require but little light in the nave, and this of a subdued and quiet, religious tone. On the other hand, the chancel and altar, with its elaborate images and decorations is the most prominent point for the attention of the communicants, and requires a carefully planned and rich lighting effect.

The service in most dissenting churches, particularly the Presbyterian, Congregational, Unitarian, Baptist, and Methodist, demand frequent use of the eyes by the members in reading responses and singing. Furthermore the symbolic features of the service and equipment so prominent in Roman Catholic and High Church Episcopal Churches are entirely absent. The lighting should, therefore, be ample for use and need not be employed primarily to accent the religious tone of the building.

In Jewish synagogues, on the other hand, we find the symbolism of early Eastern art and religions carried almost to the extreme. Each detail has its meaning determined by precedent even to the fixtures, and while a good general useful light is required by the congregation, much attention must be given to the study of special effects.

Buildings erected for the use of Christian Science and other similar modern sects are quite in a class by themselves, and require essentially modern treatment in both design and illumination.

2. The second broad preliminary consideration, after the general character of the illumination has been decided upon, has to do with the general form of the structure to be lighted. Is the design light or massive? And it must be understood that the weight of the design has no necessary relation to the size of the building—it is not measured in avordupois. Some small Norman churches are essentially massive in design, while some of the largest cathedrals, such as Laon, are particularly light and airy in feeling. The design will (or should) in each case represent the fundamental characteristic of the religious tone predominant in its period, and it is this tone that should be singled out and brought into prominence by the illumination. This effect can be produced principally by the adaptation of the quality and color of light to its surroundings, and by the use of shadows whereby the structural motifs can be given prominence either by bringing them into the high lights or by marking them off dark against a lighter background depending upon the specific conditions in each case. But it must be remembered that the shadows themselves must be luminous—not mere black patches of nothingness—and hence require careful detailed study. As we have above pointed out the design depends for its beauty upon the light enabling us to see it. The architect is thus largely dependent for his material upon light and shade. These are the scales upon which he builds his symphony and any false note may destroy its harmonies and ruin its proportions.

3. Our third consideration takes up the question of the relation of the decoration to the structural lines. In good design, where the structural lines form the chief beauty of the structure and where proper care has been taken to accent these lines, usually the decoration will be sufficiently pronounced. If, however, decoration is used, as it often is, to cover up a paucity of conception it is sometimes necessary to accent the decoration in lieu of the structural motif; otherwise a feeling of unbalance may result. Or the very reverse of this treatment may be necessary.

4. A fourth consideration of special importance in church lighting relates to

the matter of perspective. It is one of the fundamental physiological factors of illumination that bright points of light brought within the field of vision produce a corresponding loss of detail in the remainder of the field, due to the automatic closing of the iris. This shuts off the quantity of light coming from less bright objects and may reduce the visual sensation they produce below the threshhold of perception so that such objects are not seen at all. Lights so placed become unduly accented and appear much nearer the beholder than they are in reality.

It is therefore evident that we should avoid all horizontal rows of lights, particularly if placed low down and always if their intrinsic brilliancy cannot be materially decreased by the use of large globes, or deep reflectors. The use of such auxiliary globes or reflectors is usually an unfortunate feature as they destroy the largely decorative feature of the bare lamp and are often too conspicuous from an architectural standpoint.

Vertical rows of lamps are not generally open to the same objection, as the lines they accent are not normally parallel to the axes of the eyes and so do not tend to reduce the perspective to such an extent as in the case of horizontal rows.

The above notes may serve to indicate briefly where our problem lies—it is hardly expected they will even do that adequately, any detailed discussion being out of the question within the space available.

* * *

Of course the principal difficulty in the use of fixtures is the fact that if hung low enough they interfere with the view, and if hung high people sitting in the back of the church will have the direct light in their eyes. If hung near the side walls or nave columns so as to be out of the view then those in the center pews get too little light. Again the architectural treatment of the fixtures made necessary by the environment may introduce still further difficulties in our efforts to secure good lighting. However, as we have said before, no definite rules for securing results can be given as each case must be studied in the light of its own merits. Good lighting is largely the result of the exercise of good taste and good judgment and only to a small extent is it the result of mathematical calculations.

Regulating Noise From Plumbing.

A very disagreeable feature of plumbing work in the home is the noise due to the operation of plumbing fixtures. In many residences the operation of the water closet in the bathroom can be heard all over the building. Such noise, however, is unnecessary and can be avoided by intelligent design of the system and judicious selection of fixtures, says a writer in a recent issue of "Shoppell's." It is well to be acquainted with the various closets that are on the market, so that when a noiseless one is wanted it can be specified by catalogue plate and number. But even when the closet is noiseless in operation, noiseless plumbing is not assured unless the supply and waste pipes are likewise proportioned to their several uses. If the supply pipes are too small, there will be a disagreeable hissing sound when water is being drawn, not only at closet fixtures but at the other points in the building. Further, if the pressure is high and properly designed faucets or suitable air chambers are not provided, there will be a pounding noise when a faucet is closed, due to water hammer. These sources of trouble can be eliminated by using slow-closing faucets and large-size supply pipes to the various fixtures.

The noise of water from closet fixtures flowing through the soil can be decreased in volume by using three-inch soil pipes in the partitions, and the remaining noise can be almost entirely done away with by filling the space around the pipe and between the laths and plaster of the partition with some non-sound conducting substance.

Electrical Contractors Organize.

By F. V. Meyers, Secretary.

ON October 19th electrical contractors from various places in California, including San Francisco, Los Angeles, San Diego, San Jose, Sacramento and Oakland, met at dinner in the private dining room of the Argonaut Hotel, San Francisco, for social intercourse and for the further purpose of considering the question of organizing a State Association of Electrical Contractors. The persons, firms or corporations (as the case may be) represented included Woodill & Hulse Electric Company of Los Angeles, Southern Electrical Company of San Diego, E. C. Wakeland of Oakland, R. W. Meyers of Fruitvale, W. W. Hanscom, president of the San Francisco Branch of the National Electrical Contractors Association, Charles E. Wiggin, Treasurer of the San Francisco Branch of the National Electrical Contractors Association, Hanbridge-Loyst Electric Company, Latchem Engineer & Electric Company, Levy Electric Company, National Electric Company, Century Electric Company, Standard Electric Company, Butte Engineering & Electric Company, California Electric Construction Company, Central Electric Company, Independent Electric Construction Company, McFell Electric Company, Electrical Supply Company of Sacramento, Jerome N. Bachman, A. E. Brooke Ridley, F. V. Meyers, Secretary of the San Francisco Branch of the National Electrical Constructors Association, and others.

After exhaustive discussion temporary organization was effected and a committee on permanent organization and by-laws was appointed. The meeting then adjourned to meet again on the following day at the same place.

Permanent organization was effected with the following officers:

President, W. S. Hanbridge.
First vice-president, W. B. Woodill.
Second vice-president, C. H. Heilbron.
Secretary-treasurer, F. V. Meyers.
Sergeant-at-arms, E. C. Wakeland.

The association has a roll of approximately sixty members throughout the State of California. Districts are being organized in the principal cities and towns, pursuant to the plan named in the by-laws, and organization is being earnestly carried forward. It is believed that within a very short time the organization will be in position to greatly benefit its members in every direction. Its policy is intended to be conciliatory toward all opposing interests, while at the same time vigorous in protecting and advancing the interests of itself and members.

Starting the New Furnace Right.

THE first few days a new furnace is in operation are apt to determine its character, if furnaces have a character. If the furnace starts off well the members of the household will be convinced that it is a good one, and it will require a number of misfortunes to remove the favorable impression. On the other hand, if the furnace behaves in an improper manner at first, doubts may be entertained regarding its future warming abilities. It is supposed the dampers in the hot air pipes have been turned in the proper direction to allow the heat to pass, and that the damper rods were put in the proper way, so the handle or ring will indicate whether the damper is closed or open. A mistake made in putting in a damper rod may cause much trouble, as the damper will appear to be open when it is closed, and much furnace talk may be required to explain why heat does not come up the register. If the cold air box is provided with a slide or damper, such appliance may have been left closed, so the furnace does not receive a supply of fresh air There may be a wide crack under the hall door so the outer air may enter and quietly run down the hall register, thus preventing any warm air from coming up. Thus the hall pipe may be acting as a cold air box.

It has been known for several years that the human eyes and nose are not pleased with smoke. On this account, if for no other, the chimney should be examined before connecting the smoke pipe. The chimney flue is liable to become stopped up by soot, mortar or even bricks which may have been dropped by the mason or fallen from the top. By building a small bonfire in the bottom of the chimney the draft can be tested. It may be well to attach a piece of iron to a rope, then proceed to the top of the chimney and lower the iron. If it arrives safely at the bottom of the chimney without encountering any obstruction, one may infer the flue is clear. If there are any openings in the furnace chimney, other than the one used by the furnace, they should be closed. While it may be supposed that all smoke pipe fits tight at each joint, it is well to be certain that a tight joint has been made where the smoke pipe joins the surface and also where it enters the chimney.

If the attendant is not accustomed to the management of a furnace, or does not take sufficient interest, ashes and clinkers may be allowed to accumulate in the firepot to such an extent that a good fire is impossible. Some houses are so constructed that grates are placed in a number of rooms, and if these grates are not in use, too much air may be carried up the various flues, resulting in a great loss of heat.

By the Way

Some Industrial Information Worth the While

Remarkable Success of the Los Angeles Pressed Brick Company

LIKE fiction reads the story of the remarkable success since its organization of the Los Angeles Pressed Brick Company. Incorporated in 1887, its growth has been phenomenal and today it stands out by itself as the operator of the largest brick manufacturing plant in the West. Good management and a thorough knowledge of the business on the part of the promoters are the main factors which have contributed to the success of this concern. With plants in Los Angeles, Santa Monica and Richmond the company is in a position to fill orders to points as far north as Vancouver, B. C., and as far east as Salt Lake City.

The Richmond plant has contributed not a little to the rebuilding of San Francisco. It is here that the company makes its highest grade of red pressed brick, experts having pronounced them by all odds the finest dry pressed brick produced on the Pacific Coast.

Naturally the company is very much pleased with the recognition its product has received at the various expositons. At the recent Alaska-Yukon-Pacific exposition in Seattle, the Los Angeles Pressed Brick Company was given the grand prize for its splendid display of pressed brick. The company was given the gold medal at the Lewis and Clark exposition at Portland in 1905, the highest award; a silver medal at the Louisiana Purchase exposition at St. Louis in 1903; and first prizes at the California State fairs at Sacramento in 1907, 1908 and 1909, on pressed brick and fire brick, and other exhibits of lesser importance.

The company's largest factory is at Los Angeles, where about ten acres in the heart of the manufacturing district are occupied. Employment is given to from one hundred and fifty to two hundred men. At this plant is manufactured pressed, glazed, enameled and ornamental brick, hollow tile fireproofing, firebrick and fireblocks, roofing tile in all the popular patterns and in both the natural red color and green glazed, mantel tile in a large variety of sizes and shades, and also the high art Faience tile. One of the latest original and exclusive creations of the company is the popular Silver Gray Glazed brick which is, indeed, a revelation in artistic brick work.

At the Santa Monica factory about seventy-five men are employed. Here the company owns fifty-seven acres of clay especially adapted for making a high grade vitrified block. The third plant, at Point Richmond, Contra Costa county, directly on the San Francisco Bay, has already been referred to. Common building brick and red dry pressed brick are made here. This plant is considered a model one of its kind, being built within the last three years and embodying all the up-to-date devices in brick manufacture. This plant is run by electrical power entirely.

The company obtains its clays from five different mines situated in four counties in Southern California. At the recent exhibition of the San Francisco Architectural Club a fine display of the company's products was made and it proved most interesting to the thousands of visitors.

Some of the many fine buildings in and around San Francisco erected of Los Angeles pressed and enameled brick and hollow tile are the following: Hewes building, Mechanics Bank building, Odd Fellows building in course of construction, Taft-Pennoyer building, Oakland, Berkeley National Bank building, Berkeley, and all the hollow tile entering into the construction of the Phelan, Gunst, Taft-Pennoyer, Royal Insurance and White House buildings.

Paving brick has been shipped to San Francisco, Oakland, Sacramento, Berkeley and Santa Cruz with orders totaling upwards of a million for Portland delivery. The company's brick is adapted not only for the heaviest down town traffic in large cities, but for residential street work and private driveways as well.

Faience tile is also being manufactured, and this is a new departure of the past few months. Recently experiments were begun to see what could be accomplished in this field at the Los Angeles plant. After a series of experiments the company's chemist developed a decorative faience tile of exceedingly handsome design and color tone, which is to be used for interior decoration in the Utah Hotel Company's building under construction at Salt Lake City from plans by Architects Parkinson & Bergstrom of Los Angeles.

The company reports a constantly growing interest in the Southwest in vitrified brick for paving purposes. Property owners in this territory, as elsewhere on the coast, have come to the same conclusion as those of the east that first cost in paving materials is not the only criterion in determining the economy of street surfaces. The long life and minimum cost of maintenance of a brick surface make this paving material really the cheapest in the course of a few years. In the east many rural committees are now using brick for surfacing country roads, the improved surface being made in narrow widths of eight to twelve feet.

Concrete Telegraph Poles.

Armored concrete continues to enlarge the field of its application. The experimental concrete telegraph poles erected by one of the great railroads running between Chicago and the Eastern coast have proved so successful that the company has decided to extend their use gradually over its Western lines.



Warehouse of the Strable Manufacturing Company, Oakland.

Hardwood Company Fills Many Contracts.

The Strable Manufacturing Company succeeds the G. H. Brown and Brown-King Lumber Company of Oakland. The old offices and warehouse on Water street, near Washington, are retained, but the storage capacity has been increased from six to thirty cars. The company carries a complete stock of all the popular hardwoods and is in a position to ship on short notice to almost any point in California. Special attention is given to orders for high-grade flooring and shipments are made in carload lots direct from the mills.

Among the buildings furnished with hardwood flooring are the White House, Newman & Levinson, David Schonwaser building, Cliff House and Emporium, all in San Francisco, the State Hospital buildings at Agnew, which order amounted to something over thirty carloads; Home for the Adult Blind, Washington and Lincoln schools in Oakland, the Richmond High School, new hotel at Stockton, bank and office building of the Stockton Savings and Loan Society, State Hospital at Napa and the Merced High School.

The Strable Manufacturing Company will handle such well-known hardwoods as mahogany, oak, walnut, cherry, maple, ash, hickory, birch, poplar dowels, ebony and rosewood.

Ventilating the Palace Hotel.

The Robert Dalziel Jr. Company has finished work on the ventilating system in the new Palace Hotel, San Francisco. The system is considered the most perfect of any that has ever been installed in the Bay City, as well as the largest, and in planning it provisions have been made for the additions to the hotel contemplated as soon as the present structure is occupied. When completed the ventilating system will have taken 105 tons of galvanized sheet-iron, and twenty direct-connected electric fans, ranging in size from 60 to 150 inches. One of the features of the ventilating system is the provisions that have been made for ventilating the bathrooms, of which there are at present 650. An exhaust register is placed in the ceiling of each room and five fans on the roof are used to discharge the air. Many of the rooms—such as the grill rooms, ladies' parlor and ball rooms—have separate systems. The intake ducts lead from the roof to the basement, and the fresh supply is purified by passing through three cleansers with a capacity of about 250,000 cubic feet per minute.

Thirty-one Miles of Pioneer Roofing.

The Pioneer Roll Paper Company, manufacturers of ready roofings, roof paint and insulating papers, and whose factories are located in Los Angeles, recently received an order from the Associated Supply Company, of San Francisco, for 400,000 square feet (31 miles) of 32-inch roofing, to be used in covering their large oil reservoirs in Kern county. The size of this order, and the source from which it came, is certainly a strong endorsement of the quality of Pioneer Roofing.

The Pioneer Roll Paper Company will be glad to send their 32-page illustrated booklet on roofs and roofings to anyone who will write for it, mentioning the Architect and Engineer.

Pureclay Brick.

The Pureclay Brick and Tile Company, whose offices are at 103 Main street, San Francisco, is having extensive improvements made to its big plant at Hilton, Cal., and when the work is finished the company will have one of the best equipped clay yards on the Pacific coast. By reason of the superior grade of clay found in the company's mines it is in a position to turn out one of the best stock bricks on the market. Proof of this is had in the following letter from Hoyt Bros., well known Santa Rosa contractors, who have used the brick on a Masonic temple at Sonoma:

November 2, 1909.

Pureclay Brick & Tile Company,
103 Main Street,
San Francisco, California.

Gentlemen:—We will state for your benefit, and as requested in former communication, that the brick that you have shipped us are the best brick we have ever received from your company, and are the best we have seen in our building experiences on this coast.

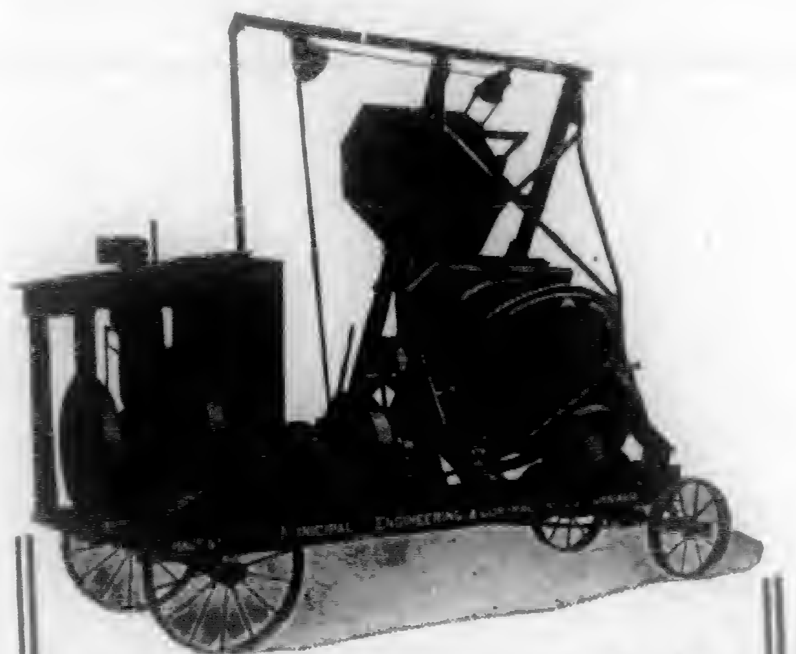
Everyone who has seen the brick, including the architect of the building in Sonoma [Masonic Temple,] has spoken very highly of them.

Very truly,
HOYT BROS.
By Henry A. Hoyt.

Hoyt Bros. stand very high with leading architects in San Francisco and their letter should carry considerable weight with those in need of a first-class stock brick. The improvements that are under way at the Hilton plant will add materially to the company's capacity. There will be twenty continuous burning kilns in operation, supplying 30,000 brick per day or over 1,000,000 a month. Something like $30,000 is being spent in rehabilitating the plant.

E. T. Maples, formerly with the California Brick Company at Antioch, and a brick man of practical experience, is now in charge of the plant as superintendent, while the management of the San Francisco office has been turned over to C. W. Randall who was formerly with the Bonner & Marshall Company, face brick and roofing tile manufacturers, of Chicago, Ill. Mr. Randall says his company is in position to take orders both large and small and fill them promptly as they have splendid railroad facilities and it is the intention to have a yard at North Point and Taylor streets where a sufficient quantity of brick will be stored to take care of immediate wants.

The plant at Hilton includes some 46 acres with a clay bank 70 feet in depth.



The Northwestern Pacific railroad operates a branch line to the works which are situated just seventeen miles northwest of Santa Rosa. While the brick turned out are a stock brick they are not machine pressed, but as good, if not better, than many of the so-called high-class repress face brick.

Inspection of Building Material.

Architects are fast beginning to realize the necessity for proper inspection of building material, not only in the interest of their clients but as a safeguard against possible complaint of the architect's incompetency.

For the benefit and convenience of engineers, architects, contractors and others who cannot maintain their own testing plants, the engineering firm of Robert W. Hunt & Company of Chicago, has located branch offices and testing laboratories in a number of large manufacturing and consuming centers — New York, St. Louis, Pittsburgh, San Francisco, and also in Montreal and London.

Their Pacific Coast laboratories are at 425 Washington street in San Francisco. The volume of the inspection work entrusted to them is such that they are enabled to maintain a large corps of experts, resident at or in close proximity with all the large foundries, rolling-mills and fabricating shops of the United States and Canada, with a number also in England, Belgium and Germany. Their very extensive and perfect system renders it possible to do the most accurate expert work for such reasonable cost, that cautious construction men feel that they cannot afford not to avail themselves of the protection thus secured.

The name and reputation of Robert W. Hunt & Company are such as to require no special commendation from the Architect and Engineer, and this note is intended for local users of building materials who may not have been advised of the location of the San Francisco branch of the firm, and who are referred to the advertisement at the top of this page.





Plant of White Bros., San Francisco.

Mammoth Stock of Hardwoods.

THE above cut shows the establishment at Spear and Howard streets, San Francisco, of White Brothers, pioneer dealers in hardwood lumber. This firm was established in 1874 by Peter and Asa L. White. At that time there was very little hardwood used in San Francisco except by the wagon-makers and the few furniture factories, the latter making nearly all of their product out of walnut, now so highly considered by connoisseurs and greatly prized wherever it is found in the few old mansions which escaped unscathed in the fire of 1906. As the years went on and conditions changed, more hardwood was used in the interior finish of residences, stores and office buildings, and by the change in freight rates which allowed the cheaper Eastern made furniture to come into the California market, furniture making here became unprofitable and furniture factories either went out of business or became general wood-working plants.

Walnut, which was the queen of cabinet woods, became scarcer and scarcer and the price advanced from ten cents per foot, at which it was sold in the later seventies and early eighties, to twenty and twenty-five cents per foot today. Walnut gradually went out of fashion and quartered oak and mahogany have taken its place. The consumption of oak and mahogany has been enormous in the last ten years. Ash, hickory and maple for wagon work are also used to a very great extent, but oak and mahogany are the kingpins of hardwood, although birch is not far behind.

White Brothers commenced carrying wagon material and cabinet woods in a small way, and by paying particular attention to the needs of the trade as they became more diversified and the demand increased, they have grown to be the largest hardwood house west of Chicago. Their market extends from Cape Nome to Valparaiso and as far east as Montana and Utah. The stock carried at their main yards in San Francisco amounts to about two million feet, but the ground space at this location is not sufficient to contain all the lumber they need in their business and they have at various places in the vicinity of the main yard, smaller yards to accommodate their stock. Besides this they take advantage of the excellent warehouse facilities offered for the finer grades of lumber which need protection from the weather.

In addition to the yards in San Francisco, White Brothers operate a sawmill at Petaluma where they have rail and

water shipping facilities. At this point is also maintained a large yard for seasoning the lumber which is sawed up at the mill. They carry there a very large stock of Jenisero, Primavera, and Spanish Cedar, as well as oak imported in logs from Japan. This yard generally contains over half a million feet of hardwoods.

White Brothers have in their yard, in addition to the hardwoods of the United States, such as oak, ash, hickory, birch, walnut, etc., etc., mahogany from Mexico, Central America and Africa, not to mention Philippine mahogany; Teak from Siam, Koa from the Hawaiian Islands; Primavera and Spanish Cedar from Mexico, Ironbark, spotted gum and other species of Eucalyptus from Australia; oak from Japan; ebony from Senegambia; Circassian walnut from the Levant, and Boxwood from Turkey.

The Pyrmont Brick Company.

A company that is commencing to make a mark for itself in the Lincoln, Cal., district is that of the Pyrmont Brick Company, a concern that has only recently entered that field, and which is now busy erecting suitable buildings for the great industry that is to be carried on. The plant is not in full working order yet and it will probably be almost a year before the finished products will be placed on the market but in addition to making rapid work on the plant, development work at the beds is being carried on and several carloads of clay are being shipped out daily. A spur track from a railroad has been built to the beds making transportation easy. President M. J. Dillman is on the ground most of the time, directing operations and making a study of the different varieties of clay found in the pits.

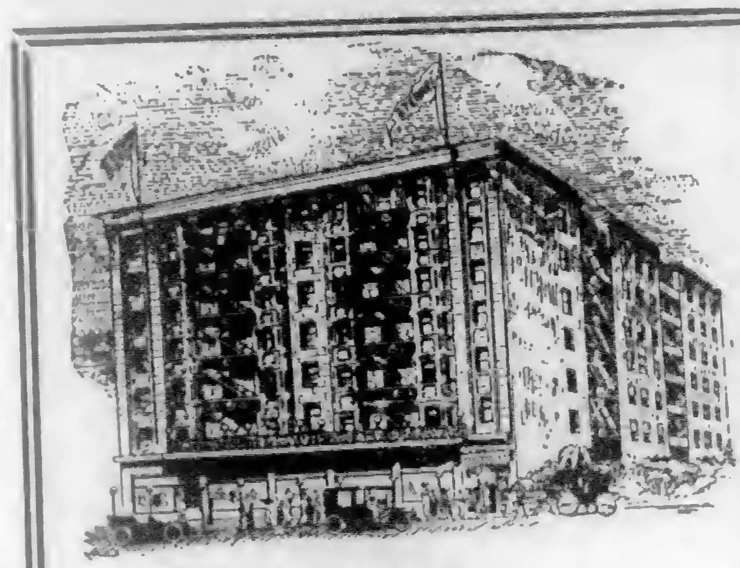
Southern Pacific Shops.

Work on the Visitacion yards of the Southern Pacific Company, which was stopped several months ago on account of the financial stringency, has been started again. Surveyors have been busy for the last few weeks preparing plans for the large roundhouse that is to be erected and the work of completing the other shops, foundations of which have already been laid, is under way.

The tract adjoins the Pacific gas and electric company's plant and it is estimated when all the buildings are completed and the yards in running order that more than 6,000 men will be employed in the valley. There are now two tracks through the hills to this point and another tunnel is being cut for two more tracks. Twenty-five miles of track are down now and thirty more are to be laid shortly.

An Index to the Advertisements

[Index continued on Page 120.]



Take Up Electrical Contracting Business.

Mr. Edwin B. Pike and Mr. Arthur B. Lebenbaum, formerly in the electrical contracting business, are now permanently located in the Wiley B. Allen building, 135-153 Kearny street, San Francisco.

The firm of Pike & Lebenbaum are the Coast representatives for the Alliance Specialty Manufacturing Company; Betts & Betts, Inc.; The Brilliant Electric Company; The A. E. Rittenhouse Company; The Tungstolier Company; etc.

They would be more than pleased to see their old friends at their offices and show rooms.



An Electric Fountain.

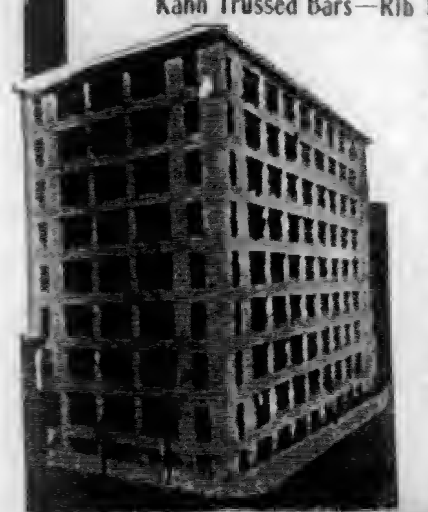
Out of fifteen or more different designs submitted, the board of park commissioners of San Diego selected that of Architect Irving J. Gill for the $10,000 electric fountain which is to be erected in the plaza with funds donated by Louis J. Wilde.

A few changes from the original design are suggested by Architect Gill. Instead of Mexican onyx Vermont or Italian marble will be used in its construction and it will be octagonal, instead of round, in shape, but the general appearance will be practically the same.

Another change he proposed was that the lion heads at the sides of the base be eliminated and that sheets of water flow between the columns and over the base into the large basin, instead of flowing from the mouths of the lions.

On a marble base according to Mr. Gill's design, will stand six columns of marble supporting a frieze which will play an important part in throwing sheets of water over the fountain. Above the frieze will be a large dome of amber glass interspersed with bright oranges and emerald greens, the glass to be cut in small sections and secured in copper frames. Over the dome of glass there will be a large gilded eagle with outspread wings. The pedestal, columns, dome and eagle will stand about 25 feet high over all in the center of a circular basin about 20 feet in diameter.

The capitals of the columns, the copper frame work of the dome and the eagle will be overlaid with gold leaf, producing a sparkling effect when lighted up by the sunlight in the day time and by electric light at night. The large basin will be of reinforced concrete, veneered with marble. The water will come out at the feet of the eagle and descend over the surface of the dome, frieze and columns. Eight streams will be thrown toward the columns from the edge of the large basin and eight sheets of water will flow over the base into the large basin.



ADVERTISERS' INDEX—Continued from Page 117

Swell Yacht for L. A. Norris.

L. A. Norris, Western sales agent for the Clinton fire-proofing materials, with headquarters in San Francisco, is having built for his private use a fine schooner yacht which is expected to eclipse anything now on the coast. The craft is being turned out by Rice Bros., well-known ship builders at East Booth, Me., and when finished will make under its own sail and power the 13,000 mile trip around the Horn to San Francisco Bay.

The dimensions of the yacht will be 91 feet 6 inches over all, 64 feet water line, 19 feet breadth and 11 feet draft. It spreads 3,457 square feet of canvas in the lower sails and is equipped with a 30 horsepower gasoline engine for auxiliary power. The boat will be flush deck, with a small cockpit for steering.

The companionway leading to the cabin will be just aft of the main mast and lead down into a small passageway, where there will be a stateroom on the starboard side and the bathroom, lockers and chart table on the port side. Aft of this, taking up the full width of the schooner, will be the owner's stateroom.

Forward of the passageway will be the main cabin, almost amidship, equipped with book cases, lockers and a space for a piano. Opening out of it on the starboard side will be a stateroom for a maid, while the captain's room and another toilet will be on the port side.

In a good sized galley aft, the engine will be placed. The forecastle, with four berths, and two in the galley, will give quarters for a crew of six.

All the interior finish except the galley and forecastle will be in white paint, with mahogany trimmings.

Six-Story Hotel.

Architects Train & Williams, 226 Exchange building, Los Angeles, have made plans for a six-story and basement European hotel to be erected on Olive street, just south of Pico, Los Angeles, for W. W. Paden. It will be brick with pressed brick front, and will have Oregon pine trim, and be equipped with elevators, steam heat, electric fixtures, baths and plumbing. It will contain 128 rooms, and will cost about $65,000.

Large Eastern Firms Prepare for Increased Business.

Mr. J. E. Dwan, known to most architects throughout the United States as the "Luxfer Prism Man," has opened offices and factory at Third and Tehama streets, San Francisco, under the firm title of J. E. Dwan & Company.

Mr. Dwan is the direct representative of a number of large Eastern firms and the object of the new company is to facilitate the handling of the California business of these firms for the benefit of their clients and customers.

The factory on Tehama street is fully equipped and a large stock of the prism units of all the various angles and shapes are carried as well as forms, tools, etc., for the installation of the well known system of reinforced concrete sidewalk lights.

The factory is also equipped with a stock of White Sanitary Glass with facilities for cutting, drilling, and grinding the same.

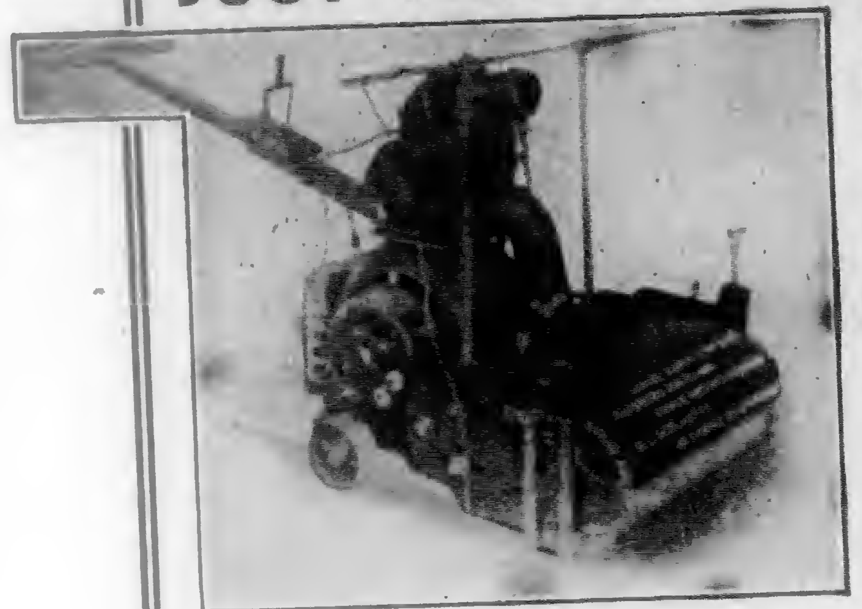
Toch Bros., the inventors of the famous R. I. W. damp resisting paints, manufacture special paints for every conceivable purpose and Mr. Dwan, who has made a special study of dampproofing and waterproofing, will be of much assistance to Toch Bros.' clients through his familiarity with these materials. Mr. Maximilian Toch, the chemist of the firm of Toch Bros., is now on the coast studying the conditions of climate and their effect upon the building materials in use, for his better understanding of the special requirements on the Pacific coast.

As engineer for E. J. Winslow, Mr. Dwan carried through the waterproofing of the basement of the Royal Insurance building in San Francisco. This basement being sunk in what was once the bay of San Francisco, is thirteen feet six inches below the level of the bay. The floor of some of the pits is subject to a lifting pressure of 800 pounds per square foot. This entire basement was waterproofed on the inside surfaces of walls and floors by the hydrolithic cement system. The waterproofing is always exposed and easily repaired in case of damage by earthquake or fire, and much floor space was gained.

The new company will also represent the Mound City Roofing Tile Company, and the Detroit Steel Products Company.

Mr. Dwan came to San Francisco about two years ago and was connected with the Willkomm Building Supply Company, as treasurer of that corporation, until its dissolution last month and has made many staunch friends by his earnestness and frank good fellowship.

JUST THE THING!



A MACHINE that is GUARANTEED to Produce an Even, Smooth Surface on Any Kind of Wood Floor, Old or New, Hard or Soft, in Residences, Stores, Factories, Bowling Alleys, Dance Halls, Etc.

Architects and Contractors endorse the

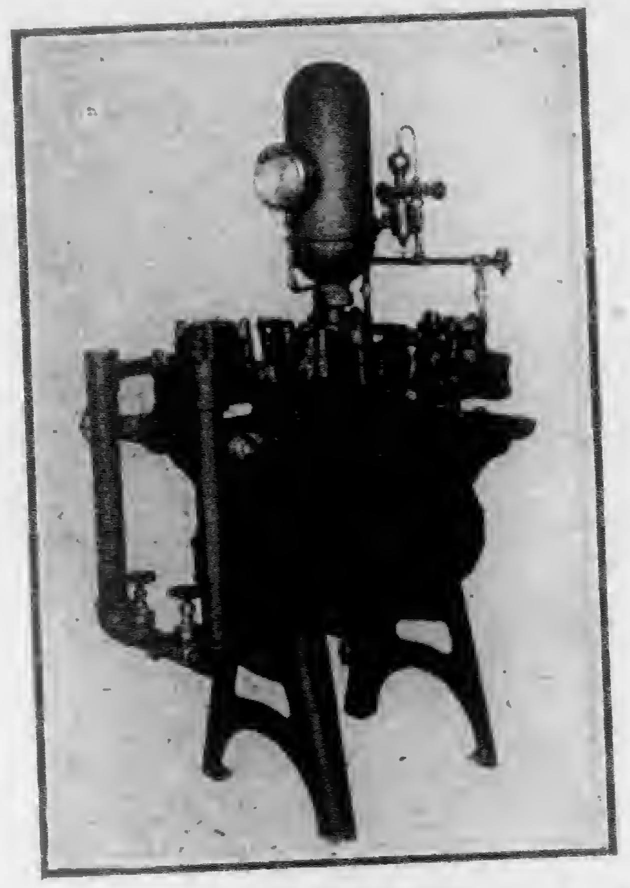
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(Sand Paper is the only perfect way to surface a Wood Floor)

Write for Descriptive Circular and Price List.

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Superior Roofing Gravel
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The Best Heating System for Theatres, Halls, Churches, Apartments and Residences.

National Furnace Co.

MANUFACTURERS AND PATENTEES

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We have the Largest and Best Gas Furnace Installation in the West.

FAN SYSTEMS A SPECIALTY

Some Features of the New Building Laws of San Francisco.

SAN FRANCISCO has some brand new building laws which are expected to work great benefit to the city. The old laws in many respects were a hindrance to architects and builders, possessing many features that were entirely impractical. The class C building question is disposed of in the following provisions:

Class C buildings shall be built with brick, stone or concrete walls supporting the adjacent floor loads and with the interior floor loads supported by studded partitions, or by wooden or steel or cast iron columns and wooden or steel girders. Floor joists may be of wood.

The limit of height shall be 84 feet, if metal lath be used on all floor and ceiling joists, girders, studding, wood furring and soffits of stairs. The limit of height shall be 55 feet if wooden lath be used, or if not lathed; but in no case shall more than four stories be included in this height.

Class C buildings may be built to the maximum height without lathing if the interior is of mill construction. Class C buildings may be built anywhere in the city.

There are special provisions concerning reinforced concrete construction.

The following is of general interest:

Reinforced concrete walls shall be at least six inches thick. If the area of wall surface included between any two adjacent wall columns and adjacent floor girders exceeds 300 square feet and is less than 400 square feet, the thickness of the wall shall not be less than eight inches. If the area exceeds 400 square feet, the wall thickness shall not be less than 12 inches, supported on the frame at each story.

In reinforced concrete walls the area of steel reinforcement shall aggregate one-half of 1 per cent of the area of the concrete, and may be placed vertically or horizontally, or part vertically and part horizontally.

No reinforcement shall be spaced more than 24 inches apart. Additional reinforcement shall be placed around openings, and all reinforcement shall be wired at each intersection. All reinforcement shall be rigidly connected at columns and girders to the steel frame.

Reinforced concrete walls may be built in the form of bearing walls of uniform section, and of same thickness required for brick walls.

If walls are built of piers and connecting walls the piers shall be calculated and constructed as columns. The connecting wall, if built of reinforced concrete without windows, may be considered as self-supporting, in which case the thickness shall be six inches in the upper 40 feet, followed by an increase of three inches in thickness for every additional 40 feet height.

Where such walls are pierced by openings for doors and windows the entire loads shall be concentrated on the piers, which shall be proportioned as columns.

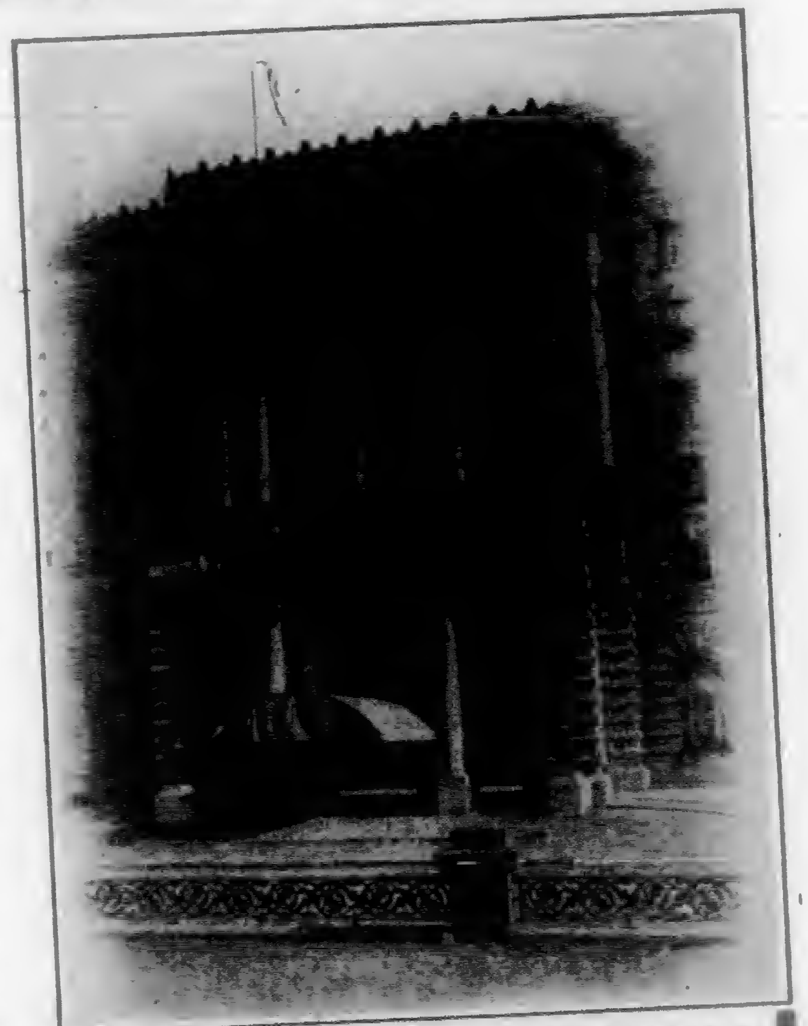
A wooden building is classed as one having exterior walls or a portion thereof constructed of wood. Wooden frames or frame or wooden buildings covered with metal, plaster, ties or terra cotta, or veneered with masonry, shall be deemed to be frame or wooden structures. No frame or wooden building now existing within the fire limts can be enlarged or built upon, nor can any frame or wooden building now existing within the fire limits be repaired without a permit from the board of public works. The walls of frame or wooden buildings must be constructed with studding, covered with weathered boarding on the outside and no uncovered studding can be placed against the wall of an adjacent building or structure. Provision is made for frame factories that are more than two stories high as follows:

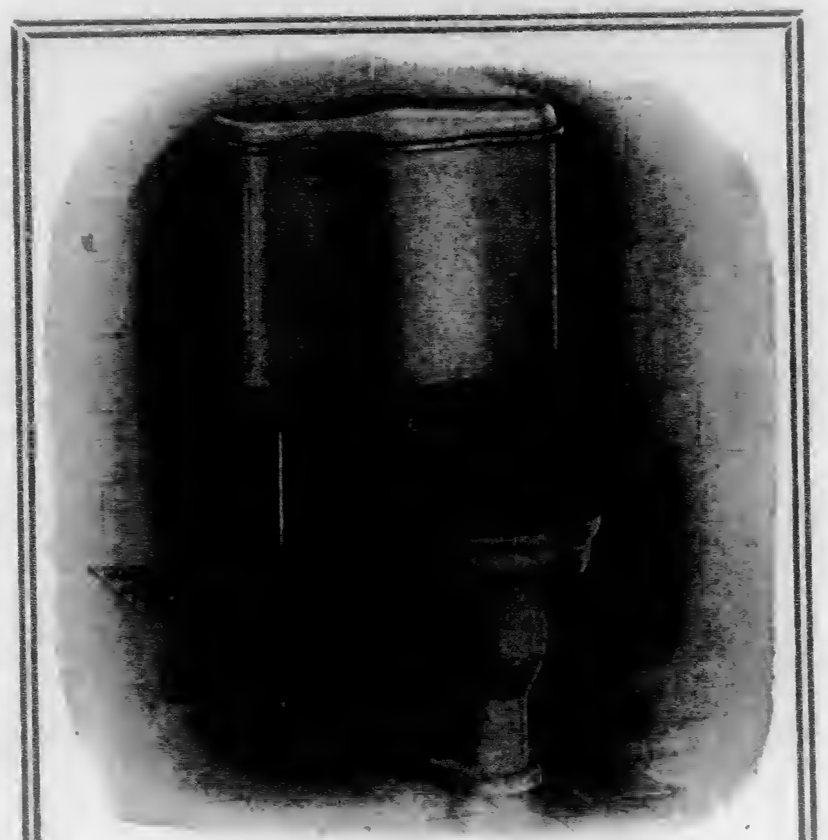
All frame or wooden buildings more than two stories high hereafter erected or enlarged to be used as factories, shall be constructed as follows: The weight of all the floors shall be concentrated at certain points, and no support shall rest directly upon a stud wall, but all beams, girders and girders supporting floors shall rest directly upon posts. Said beams and girders supporting floors shall not be more than nine feet apart; upon these shall rest the floor, which shall extend from one girder or beam to another, and shall not be less than of three inches thick plank. Planks shall be laid to the ends of the timbers. The filling between posts and walls shall be built of not less than 2 x 4 inch studs, 16 inches from centers.

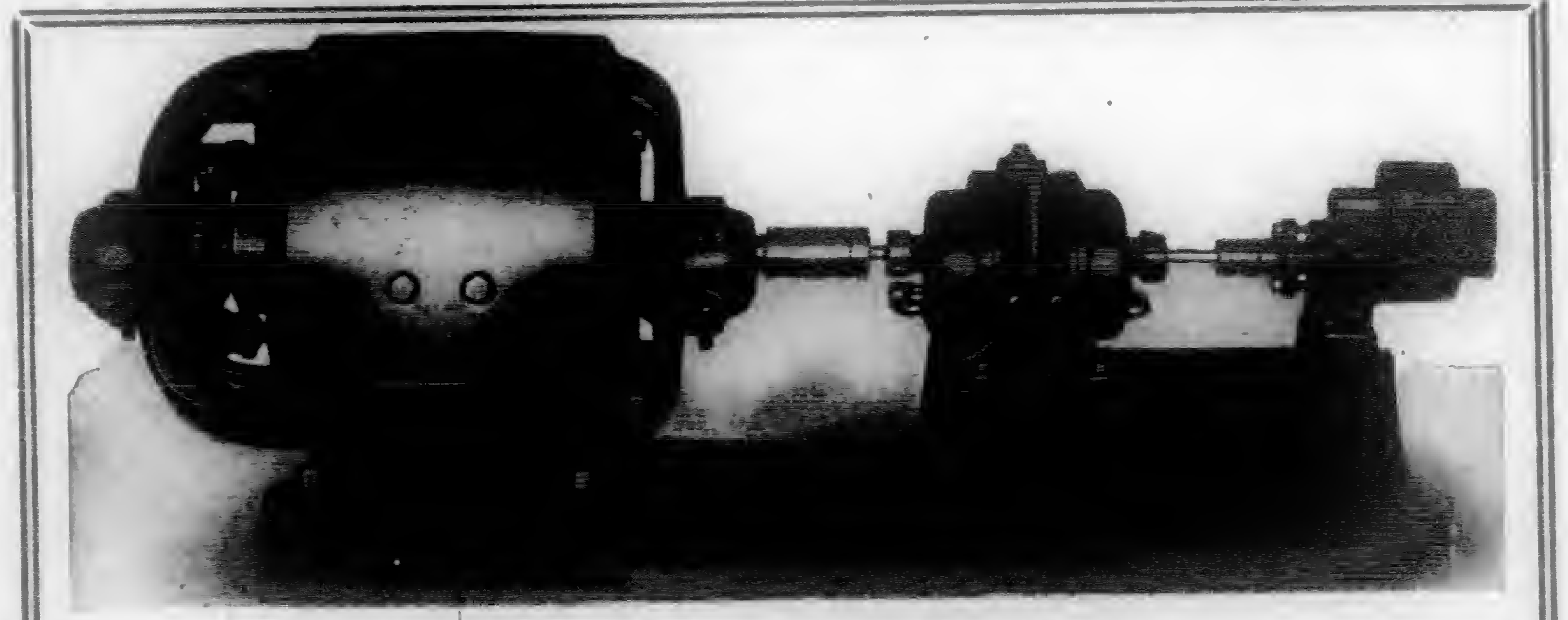
Much interest is found in the rule concerning theaters. Every theater hereafter erected to be used for theatrical or operatic purposes must be constructed in accordance with the requirements of the ordinance relating to class A or steel frame construction.

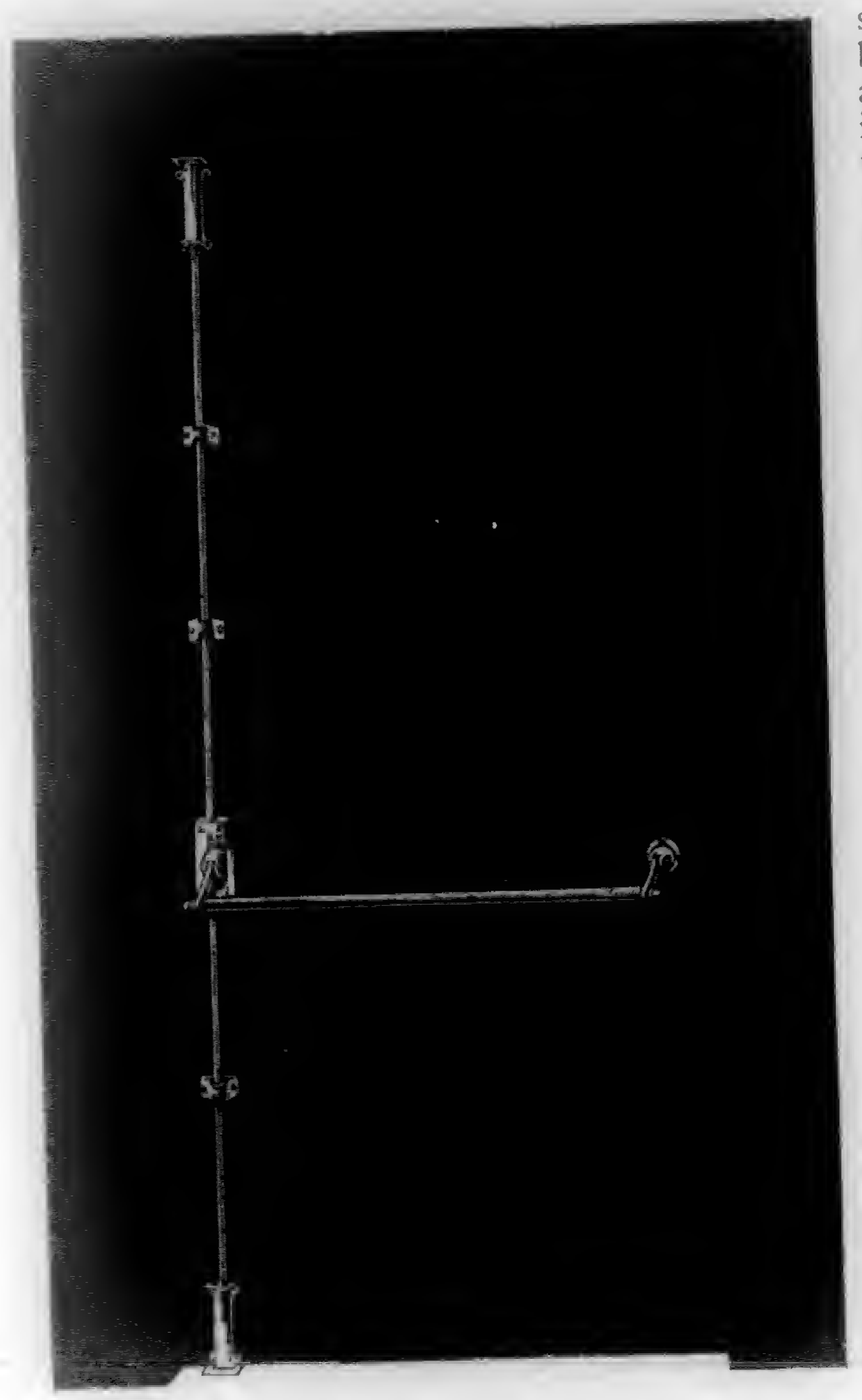
In the matter of safeguards for fire for both public and private buildings the new law provides that all existing buildings and those hereafter erected exceeding 100 feet in height shall be provided with such auxiliary fire apparatus and appliances as wrenches, spanners, fire extinguishers, hooks, axes and pails as may be required by the chief of the fire department; all of said apparatus to conform in design to those in use by the fire department.

The ordinance adopted by the supervisors calling for the removal of all the buildings erected in San Francisco since April 18, 1906, in violation of the building law and ordinances of the city and county is made a part of the law and the date for removing all such structures is May 1, 1910.









Showing Bolt in Position

The Russwin Panic Exit Bolt.

The Russell & Irwin Mfg. Company, New Britain, Conn., San Francisco and New York, is making the Russwin Panic-Exit Bolt, which, as the name implies, is intended for use on schoolhouse, theater, assembly hall and public building entrances and exit doors. The construction of this bolt is such that the slightest touch on the bar, which extends horizontally across the face of the door, will instantly release the bolting members and open the door. In the various types of locking mechanism ordinarily in use on entrance and exit doors the pressure against the door by a panic-stricken audience will almost invariably cause a binding of bolts, making it impossible to open the way to safety. With the Russwin Panic-Exit bolt any pressure upon the door accelerates the unlocking action. This device is sensitive in action yet most substantial in construction, all parts being made of solid bronze metal castings with the exception of the bolt heads which are hardened steel, each part machined and carefully fitted. Various types of this bolt are made to meet various requirements. For fire exits a bolt allowing exit at all times but permitting no entrance; for double entrance doors the bolting mechanism on the dummy half of the door and a Russwin unit lock set on the active half; both doors in case of necessity being thrown open by pressure upon the bar extending across the face of the dummy half. For classroom or entrance doors the bolt has a side-latching mechanism operated from the outside by a knob and inside by the usual bar across the face of the door. All types while operating in different ways secure the instant releasing and opening of the door.

Do High-class Decorating.

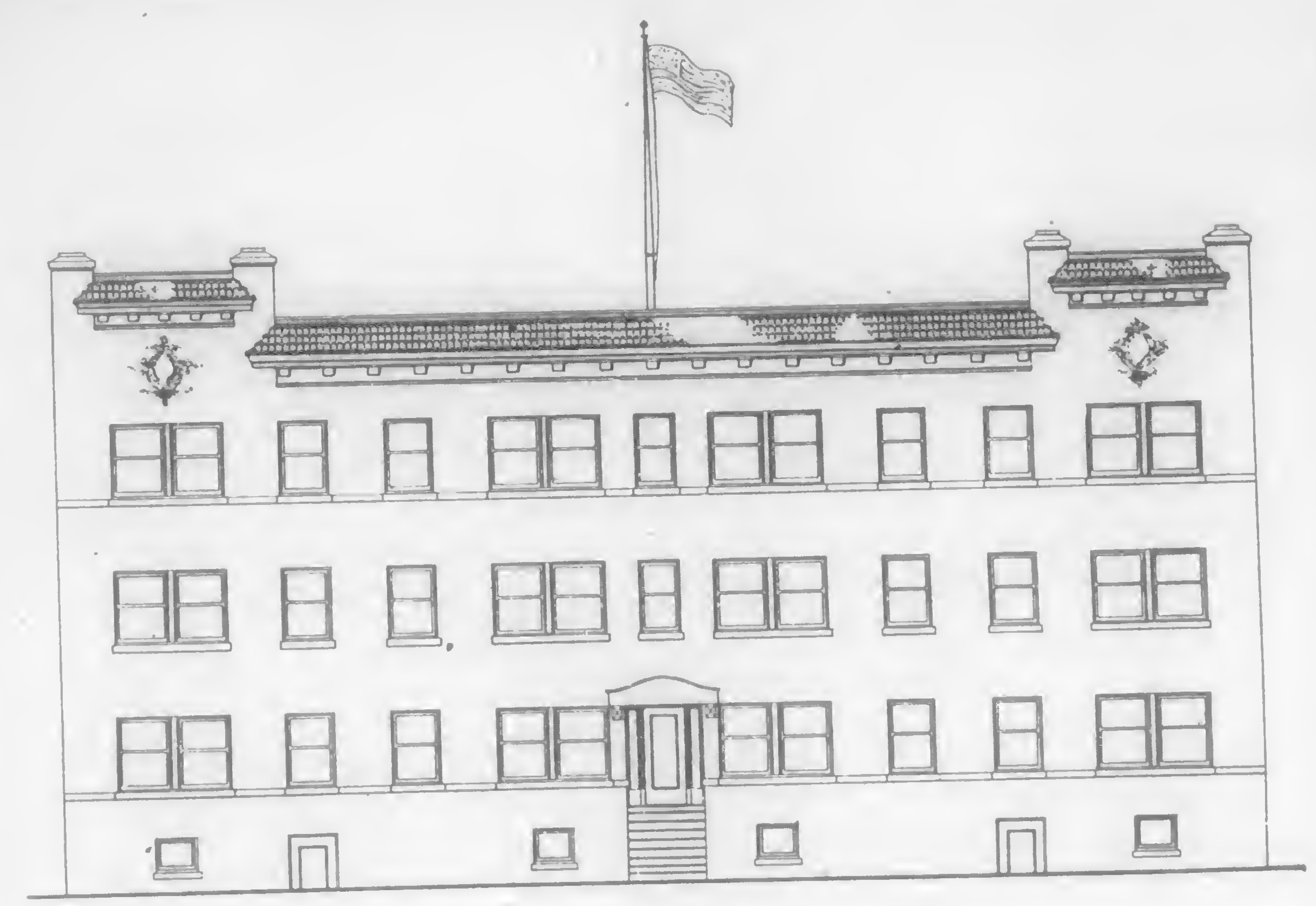
Pfister & Company have reorganized, with Jean Pfister, president; O. J. Freeman, vice-president, and O. M. Kendall, secretary and treasurer. This firm is fast gaining an enviable reputation as artistic decorators and high-class painting contractors. Their specialty is store decorations. Recent contracts include the interior painting of the Baldwin Piano house on Sutter street. Work will be taken direct from the owner or through the architect.

Large Brick Structure.

A brick structure to cover a lot 75x115 feet in the north line of Clay street near East street, San Francisco, is being erected at a cost, including the land, of $100,000. It is to be a two-story building with elevator and will contain four stores and seventy rooms. The lot runs through to Commercial street, so that the building will have two frontages. Frank S. Holland is the architect.

Vacuum Company Moves.

The San Francisco Compressed Air Cleaning Company has moved from Montgomery street to 397 Sutter street, southeast corner, San Francisco, where a handsome suite of offices has been leased.



Apartment House, San Francisco, for L. H. Sly

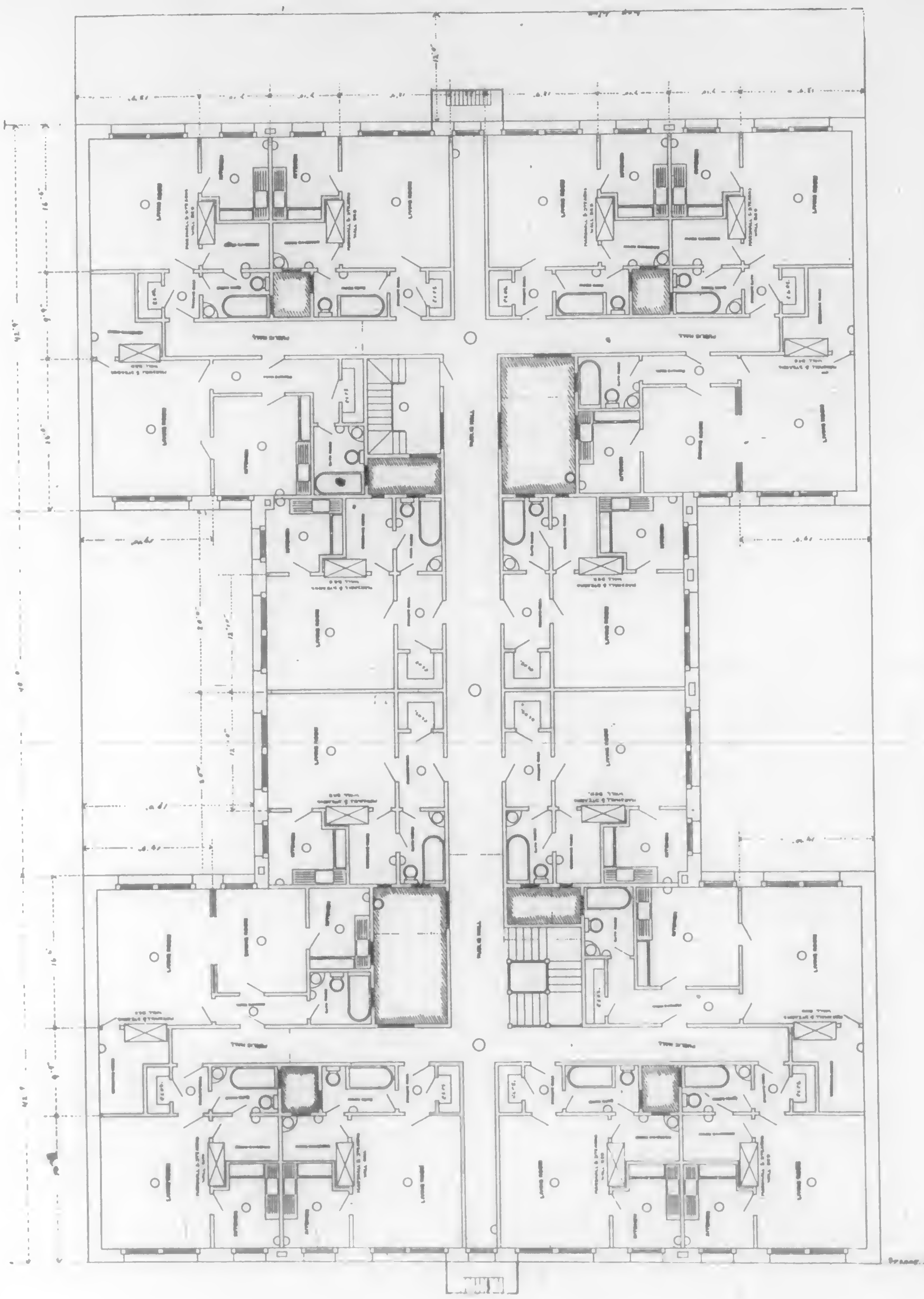
Popular Two-Room Apartments.

THE illustration above shows the Turk street elevation, San Francisco, of a handsome Mission style apartment house being erected by L. H. Sly and which is equipped with the Marshall & Stearns Improved Patent Wall Bed. As will be seen by examination of the floor plan, every bed has direct ventilation from the outside, making perfect sanitation without the usual "airing inconveniences." Special attention is called to the dressing room arrangement, as shown in the floor plan, and which is carried out in each and every one of the two-room apartments. This dressing room arrangement is an entirely new one for San Francisco.

The chief objection to a two room apartment in the past has been the fact that there was no privacy.

In this case Mr. Sly, who has probably had more experience than any other one man in the city, in this line, has built in the dressing room what is really a large closet, but has given his tenant, so far as privacy is concerned, all the conveniences of an additional room. One will notice that this dressing room is connected direct with the bath room, which connects with the private hall.

The offices and show rooms of the Marshall & Stearns Company are on the eleventh floor of the Phelan building, San Francisco.



Floor Plan, Apartment House for L. H. Sly, Showing Wall Bed Equipment.

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